Public Works and Government Services Canada

Requisition No. EZ897-161025

MERX I.D. No. _____

SPECIFICATIONS
for

Colwood FOD North Area Remediation

CFB Esquimalt, Colwood, BC

Project No. R.076840.001

APPROVED BY:

_____ 2015/08/11
Regional Manager ES Date

_____ 2015/08/12.
Construction Safety Coordinator Date

TENDER:

_____ 11 Aug 2015
Project Manager Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
#219 – 800 Burrard Street, Vancouver, B.C. V6Z 0B9

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 00 06 - Special Procedures for Traffic Control.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 01 35 29.14 - Health and Safety for Contaminated Sites

.5 Security requirements and procedures for accessing DND property.

1.2 GENERAL INFORMATION

.1 Public Works and Government Services Canada (PWGSC), on behalf of the Department of National Defence (DND), intends to remediate Colwood Fuel Oil Depot (FOD) North Area. The location of the lands to be remediated is at the CFB Esquimalt Colwood property in Colwood, British Columbia (Drawing 1).

.2 All work will be carried out under contract to PWGSC on behalf of DND. PWGSC will be responsible for approving the final extent of materials to be removed, their destination, monitoring remediation progress, and assuring quality of the work.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises remediation of the COL FOD Site. The scope of work includes excavation, stockpiling and management of petroleum hydrocarbon and metals contaminated soil, transport of the soil, off-site disposal of the soil at a provincially permitted landfill, and the restoration of the site. Handling and collection of impacted surface water may be required. Restoration includes placing imported clean fill to minimize slope instability and imported clean topsoil, and hydro seeding with a native grass mix. Specifically, the Contractor will be responsible for the following:

.1 Meet the requirements of Section 01 33 00 - Submittal Procedures, Section 01 35 00 06 - Special Requirements for Traffic Control, Section 01 35 43 - Environmental Procedures, and Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.2 Develop a Site Specific Health and Safety Plan for the remedial excavation program.

.3 Locate all utility lines within and immediately surrounding the work area and obtain the applicable “Dig Permit” from DND. A Site Location Map (Drawing 1) shows the location of the site. The site layout including site access, approximate excavation area, stockpile management area and Contractor staging area is shown on Drawing 2. A site plan is included (Drawing 626399-012) showing the work area and proposed excavation limits. Drawings 626399-005 and 626399-006 show the borehole locations and analytical results.

.4 Provide washroom facilities.

.5 Make arrangements with and obtain all applicable permits from authorities having jurisdiction for off-site disposal of the soil.

.6 Provide documentation from the proposed disposal facility for approval by PWGSC demonstrating the current license or permit to accept the contaminated soil removed from the site.

.7 Provide all equipment and manpower necessary to excavate, load, and transport to an off-site permitted disposal facility 2,100 tonnes of petroleum hydrocarbon contaminated soil at concentrations less than the BC Hazardous Waste Regulation (HWR) and greater than the BC Contaminated Sites Regulation (CSR) Residential land use standards (i.e., CSR RL+). Some of the petroleum hydrocarbon contaminated soil is also contaminated with CSR RL+ metals. All work must be conducted in compliance with all applicable federal and provincial standards and regulations.

.8 Provide all equipment and manpower necessary to excavate, load and transport to an off-site permitted disposal facility 500 tonnes of petroleum hydrocarbon contaminated soil at concentrations greater than the BC HWR standards. All work must be conducted in compliance with all applicable federal and provincial standards and regulations.

.9 Groundwater and/or ponded surface water is not expected to be encountered within the excavation however, the Contractor is responsible for the management and treatment of all water that enters the excavation. All water collected from the dewatering of the excavation must meet all applicable federal and provincial standards and regulations prior to discharge.

.10 Noise and dust control measures will be the responsibility of the contractor to meet PWGSC requirements.

.11 Provide all equipment and manpower necessary to assist the Departmental Representative in collection of confirmatory soil samples from the footprint of the remedial excavation as deemed necessary by the Departmental Representative.

.12 Provide all equipment, manpower necessary to transport, place and compact backfill at the site. The upper 0.15 m of backfill will consist of topsoil in preparation for planting (planting will be completed by others). It is anticipated that 2,600 tonnes of backfill will be required, which will include 2,350 tonnes of granular fill and 250 tonnes of topsoil. The site will be compacted to PWGSC specifications as stated in Section 31 23 33.01 – Excavation, Trenching and Backfilling.

.13 Provide all equipment, manpower necessary to grade, topsoil and seed the existing access road.

.14 Provide all equipment, manpower necessary to hydro seed the site with a native grass mix.

.15 Remove waste materials from site at end of each work-day.

.16 Repair and restore all roadways used to the same condition or better as they were found prior to the start of work and as approved by the Departmental Representative.

1.4 CONTRACT METHOD

.1 Construct Work under unit price / lump sum contract.

.2 Employ suppliers and subcontractors approved by the Departmental Representative for the Work.

1.5 CONTRACTOR USE OF PREMISES

.1 Coordinate use of premises under direction of the Departmental Representative.

.2 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.3 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative

.4 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.6 OWNER OCCUPANCY

.1 During the entire remediation period, the site Owner will manage adjacent areas.

.2 Co-operate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Owner usage of adjacent areas. In the event of a conflict the Contractor must accommodate changes to their operations to minimize interference with Owner operations.

1.7 EXISTING SERVICES

.1 Locate all utility lines within and immediately surrounding the work area. Completeness and accuracy of any available utility drawings are not guaranteed and the Contractor is responsible for confirming locations of all utilities.

.2 Notify the Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.3 Minimize duration of interruptions, and where required, provide temporary services to maintain critical systems.

.4 Where Work involves breaking into or connecting to existing services, give PWGSC 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.

.5 Provide alternative routes for personnel, pedestrian and vehicular traffic and provide traffic control services (flag persons) to direct traffic (if necessary).

.6 Establish location and extent of service lines in area of work before starting Work and obtain the applicable “Dig Permit” from DND. Notify the Departmental Representative of findings.

.7 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to PWGSC approved schedule.

.8 Where unknown services are encountered, immediately contact the Departmental Representative and confirm findings in writing.

.9 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved the Departmental Representative and authorities having jurisdiction.

.10 Survey locations of maintained, re-routed and abandoned service lines and provide CAD drawings to the Departmental Representative.

.11 Soil must be disposed of at a provincially permitted facility that accepts soil classified as containing petroleum hydrocarbon and metals concentrations greater than the BC CSR Residential land use standards or, soil classified as containing petroleum hydrocarbon concentrations greater than the BC HWR standards. Prior to initiation transport and disposal, the contractor must submit the proposed disposal facility(ies) including a copy of their current license or permit for approval by PWGSC.

1.8 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

- .1 Utility Plans
- .2 Contract Drawings.
- .3 Specifications.
- .4 Addenda.
- .5 Change Orders.
- .6 Other Modifications to Contract.
- .7 Field Test Reports.
- .8 Copy of Approved Work Schedule.
- .9 Health and Safety Plan and Other Safety Related Documents.
- .10 Daily records of on-site (within site) movement of soil.
- .11 Daily records of all material movement onto and off the site, including records (manifests) of waste movement and disposition, and analytical records.
- .12 Environmental Management Plan
- .13 Other documents as specified by the Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Approved: 2006-06-30

Part 1 General

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Working Days: Monday through Friday (excluding statutory holidays).

.5 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.6 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.7 Master Plan: summary-level schedule that identifies major activities and key milestones.

.8 Milestone: significant event in project, usually completion of major deliverable.

.9 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.10 Project Planning, Monitoring and Control System: overall system operated by the Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Work hours are limited to 7:00 AM to 5:00 PM Monday to Friday unless otherwise approved by the Departmental Representative.

.3 Plan to complete Work in accordance with prescribed milestones and time frame.

.4 Limit activity durations (between milestones) to maximum of approximately 10 working days, to allow for progress reporting.

.5 Carry out Work in accordance with the Contract and as follows:

.1 Do not change Schedule accepted by the Departmental Representative without approval from Departmental Representative.

.6 Conduct interim reviews of Work progress based on Work schedule at Progress Meetings or as instructed by the Departmental Representative and schedule updated by Contractor as instructed by the Departmental Representative.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to the Departmental Representative Section 01 33 00 - Submittals within 10 working days of Award of Contract Bar Chart as Master Plan for planning, monitoring and reporting of project progress. Bar Chart to include:

.1 Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table as well as date of Contract Award, utility locates and kickoff meeting.

.2 Dates of Submittals including Health and Safety submittal, Environmental Protection Plan submittal, all other submittals required prior to project initiation as outlined in Section 01 33 00 - Submittal Procedures and close-out submittals as outlined in Section 01 33 00 - Submittal Procedures.

.3 Dates of receipt of all permits, authorizations, approvals, etc. as required for the work.

.4 Dates of inspection and testing.

.5 Dates of as-built survey and final inspection.

.6 Final Completion date within the time period in accordance with the Contract, including Amendments.

.3 Submit Project Schedule to the Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 The Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Pre-Mobilization Submittals.
.3 Permits.
.4 Mobilization.
.5 Excavation.
.6 Soil Management (disposal).
.7 Collection of Imported Backfill Material Quality Review, acceptance/rejection and contingency for finding a new source.
.8 Backfilling and Site Grading.
.9 Restoration.

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings with the Departmental Representative. Identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 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 proceed with Work affected by submittal until review is complete and approved.

.3 Present information in SI Metric units.

.4 Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.5 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 co-ordinated 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.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Ensure field measurements by quantity surveyor are coordinated with on-site Work.

.8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.9 Keep one reviewed copy of each submission on site.

1.2 SUBMISSIONS

.1 Submit the following reports and documentation within 5 working days after date of Notice to Proceed and prior to mobilization to site:

.1 Project Schedule.

.2 Health and Safety Plan.

.3 Contractor’s Environmental Management Plan.

.4 Evidence of appropriate licensing for transport of contaminated soils or Hazardous Waste (including for any subcontractor retained to transport such materials).

.5 Identification of the facility(s) that will be used to treat and/or dispose of each of the categories of materials identified. Evidence that they are authorized and/or licensed to accept, treat and dispose of the specific category of material.
Disposal Facility requirements:

.1 Be an existing offsite facility located in Canada.

.2 Be designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.

.3 Hold a valid and subsisting permit, certificate, approval, or any other form of authorization issued by a province or territory for the disposal of soil, sediment, general refuse, construction/demolition waste or other material requiring disposal.

.4 Comply with applicable municipal zoning, bylaws, and requirements.

.5 If proposed Disposal Facility is not acceptable to Departmental Representative, identify an alternate Disposal Facility that is acceptable.

.6 Excavation Design.

.2 Submit the following reports / documentation daily.

.1 Daily work summaries.

.2 Meeting minutes.

.3 Schedule updates.

.4 Daily overburden and contaminated soil volumes as agreed upon with the Departmental Representative and daily weigh tickets at the end of the project.

.3 Submit the following reports / documentation within 24 hours of occurrence.

.1 Incident and Accident Reports.

.4 Allow 5 days for the Departmental Representative review of each submission.

.5 Adjustments made on submissions by the Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Departmental Representative prior to proceeding with Work.

.6 Make changes in submissions as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of revisions other than those requested.

.7 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.

.8 Submissions include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's signature of 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:

.9 The review of drawings by PWGSC is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that PWGSC approves detail design inherent in drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in 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, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 MANIFEST

.1 A copy of all manifests and/or truck weigh scale documents for material brought onto or removed from the site are to be provided to the Departmental Representative.

.2 Manifest and/or weigh scale documents are to be completed in accordance with applicable federal and provincial regulations.

1.4 PHOTOGRAPHIC DOCUMENTATION

.1 Provide digital photos in “Joint Photographic Experts Group” (.jpg) format for Progress Photographs and Final Photos.

.2 Digital photographs to have a minimum of 2,592x1,944 pixel (5 Megapixel) resolution.

.3 Progress and Final Photographs to be submitted on a compact disc (CD).

.4 Quantity: Provide sufficient number of photographs to adequately describe the work activities carried out during the reporting period.

.5 Submit progress photographs weekly with last weekly report or as directed by the Departmental Representative.

.6 Submit final photographs prior to final progress payment request.

1.5 CERTIFICATES AND TRANSCRIPTS

.1 Notice of Project submitted to PWGSC prior to mobilization.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 35 29.14 - Health and Safety for Contaminated Sites.

1.2 REFERENCES

.1 Manual of Uniform Traffic Control Devices (MUTCD) published by the Transportation Association of Canada (2014).

1.3 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 Protect traveling public from damage to person and property.

.3 Develop and submit a traffic control plan as part of the Health and Safety plan as stipulated in Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.4 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by the Departmental Representative. At minimum one lane must be kept open for traffic flow at all times.

.5 When working on travelled way:

.1 Place equipment in position to minimize interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.6 Do not close any lanes of traffic without approval of the Departmental Representative. Before re-routing traffic, erect suitable signs and signalling devices in accordance with instructions contained in Part D of MUTCD.

.7 Keep travelled way graded, free of potholes and of sufficient width for required number of lanes of traffic.

.8 Provide and maintain access and egress to property fronting along Rosebank Road (roads to and from site and temporary stockpile area). Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of the Departmental Representative.

.9 Contractor’s traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.10 Traffic routes must be maintained at all times during the completion of the project Work. The Contractor shall provide access and temporary relocated roads as necessary to maintain traffic.

.11 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.12 Maintain access and haul roads as necessary.

.13 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners and dangerous cross traffic shall be avoided.

.14 Provide necessary lighting, signs, barricades and distinctive markings for safe movement of traffic.

.15 Dust control: adequate to ensure safe operation at all times.

.16 Locations, grade, width and alignment of construction and hauling road: subject to approval by the Departmental Representative.

.17 Remove, upon completion of work, any access and haul roads.

1.4 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Sign and Devices, of MUTCD.

.3 Place signs and other devices in locations recommended in MUTCD.

.4 Meet with the Departmental Representative prior to commencement of Work to prepare a list of signs and other devices required for the project. If the situation on-site changes, revise the list to the approval of the Departmental Representative.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.5 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag personnel, trained in accordance with, and properly equipped as specified in MUTCD, for situations as follows:

.1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.

.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.7 Delays to public traffic due to Contractor's operators: maximum 5 minutes.

.2 The contractor will not block the roadway or otherwise cause traffic delays on existing roadways.

1.6 OPERATIONAL REQUIREMENTS

.1 In the event of an emergency, the Contractor shall provide immediate access along Rosebank Road.

.2 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by the Departmental Representative to protect and control public traffic.

.3 Maintain existing conditions for traffic crossing right-of-way.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. Not Used.

1.3. Action and Informational Submittals

1.3.1. Submit to Departmental Representative Submittals listed for review.
1.3.2. Work affected by Submittal must not proceed until review is complete.
1.3.3. Submit the following:
1.3.3.1. Health and Safety Plan.
1.3.3.2. Copies of reports or directions issued by federal and provincial health and safety inspectors.
1.3.3.3. Copies of incident and accident reports.
1.3.3.4. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
1.3.3.5. Emergency Procedures.
1.3.3.6. Notice of Project.
1.3.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 Working Days after receipt of the plan.
1.3.5. If changes are required, revise the plan as appropriate and resubmit to Departmental Representative within 5 Working Days.
1.3.6. Submittal of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It will not:
1.3.6.1. Be construed to imply approval by the Departmental Representative.
1.3.6.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.
1.3.6.3. Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.4. References

1.4.1. Government of Canada:
1.4.1.1. Canada Labour Code - Part II.
1.4.1.2. Canada Occupational Health and Safety Regulations.
1.4.2. National Building Code of Canada (NBC):
1.4.2.1. Part 8, Safety Measures at Construction and Demolition Sites.
1.4.3. Canadian Standards Association (CSA) as amended:
1.4.3.1. CSA Z797-2009 Code of Practice for Access Scaffold.
1.4.3.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
1.4.3.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
1.4.4. Fire Protection Engineering Services, HRSDC:
1.4.4.1. FCC No. 301, Standard for Construction Operations.
1.4.4.2. FCC No. 302, Standard for Welding and Cutting.
1.4.5. American National Standards Institute (ANSI):
1.4.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
1.4.6. Province of British Columbia:
1.4.6.1. Workers Compensation Act Part 3-Occupational Health and Safety.

1.4.6.2. Occupational Health and Safety Regulation.

1.5. Regulatory Requirements

1.5.1. Comply with codes, acts, bylaws, standards and regulations applicable to the performance of the Work in accordance with the Contract to ensure safe operations at Site.

1.5.2. In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will instruct on the course of action to be followed.

1.6. Worker's Compensation Board Coverage

1.6.1. Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the Final Completion of the Work.

1.6.2. Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.7. Compliance with Regulations

1.7.1. PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.7.2. It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the Work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.8. Responsibility

1.8.1. Assume responsibility as the Prime Contractor for Work under this Contract.

1.8.1.1. Be responsible for health and safety of persons onsite, safety of property onsite and for protection of persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

1.8.1.2. Comply with and enforce compliance by employees with safety requirements of Contract, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9. Health and Safety Coordinator

1.9.1. The Health and Safety Coordinator must:

1.9.1.1. Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the Site to perform Work.

1.9.1.2. Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.

1.9.1.3. Be on Site during execution of Work.

1.10. General Conditions

1.10.1. Provide safety barricades and lights around Site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

1.10.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the Site:

1.10.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

1.11. Project/Site Conditions

1.11.1. Work at Site will involve contact with contaminants identified in Specifications and environmental reports.

1.12. Work Permits

1.12.1. Obtain specialty permits related to project before start of Work.

1.13. Filing of Notice

1.13.1. The Prime Contractor is to complete and submit a Notice of Project as required by Provincial or Territorial authorities.

1.13.2. Provide copies of all notices to the Departmental Representative.

1.14. Health and Safety Plan

1.14.1. Conduct a site-specific hazard assessment based on review of Contract, required Work, and project Site. Identify any known and potential health risks and safety hazards.

1.14.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

1.14.2.1. Primary requirements:

1.14.2.1.1. Contractor's safety policy.

1.14.2.1.2. Identification of applicable compliance obligations.

1.14.2.1.3. Definition of responsibilities for project safety/organization chart for project.

1.14.2.1.4. General safety rules for project.

1.14.2.1.5. Job-specific safe work, procedures.

1.14.2.1.6. Inspection policy and procedures.

1.14.2.1.7. Incident reporting and investigation policy and procedures.

1.14.2.1.8. Occupational Health and Safety Committee/Representative procedures.

1.14.2.1.9. Occupational Health and Safety meetings.

1.14.2.1.10. Occupational Health and Safety communications and record keeping procedures.

1.14.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.

1.14.2.3. List hazardous materials to be brought onsite as required by Work.

1.14.2.4. Indicate engineering and administrative control measures to be implemented at the Site for managing identified risks and hazards.

1.14.2.5. Identify personal protective equipment (PPE) to be used by workers.

1.14.2.6. Identify personnel and alternates responsible for site safety and health.

1.14.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.

1.14.3. Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.

1.14.4. Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

1.14.5. Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) will not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract.

1.15. Emergency Procedures

1.15.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (ie names/telephone numbers) of:
1.15.1.1. Designated personnel from own company.
1.15.1.2. Regulatory agencies applicable to Work and as per legislated regulations.
1.15.1.3. Local emergency resources.
1.15.1.4. Departmental Representative and site staff.
1.15.2. Include the following provisions in the emergency procedures:
1.15.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
1.15.2.2. Evacuate all workers safely.
1.15.2.3. Check and confirm the safe evacuation of all workers.
1.15.2.4. Notify the fire department or other emergency responders.
1.15.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
1.15.2.6. Notify Departmental Representative and Site staff.
1.15.3. Provide written rescue/evacuation procedures as required for, but not limited to:
1.15.3.1. Work at high angles.
1.15.3.2. Work in confined spaces or where there is a risk of entrapment.
1.15.3.3. Work with hazardous substances.
1.15.3.4. Underground work.
1.15.3.5. Work on, over, under and adjacent to water.
1.15.3.6. Workplaces where there are persons who require physical assistance to be moved.
1.15.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
1.15.5. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.16. Hazardous Products

1.16.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
1.16.2. Where use of hazardous and toxic products cannot be avoided:
1.16.2.1. Notify Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as required.
1.16.2.2. In conjunction with Departmental Representative, schedule to carry out Work during "off hours" when tenants have left the building.
1.16.2.3. Provide adequate means of ventilation as required.

1.17. Unforeseen Hazards

1.17.1. Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the Work, immediately stop Work and notify the Departmental Representative verbally and in writing.

1.18. Posted Documents

1.18.1. Post legible versions of the following documents onsite:
1.18.1.1. Health and Safety Plan.
1.18.1.2. Sequence of Work.
1.18.1.3. Emergency procedures.

1.18.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
1.18.1.5. Notice of Project.
1.18.1.6. Floor plans or Site plans.
1.18.1.7. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the Site for review by employees and workers.
1.18.1.8. Workplace Hazardous Materials Information System (WHMIS) documents.
1.18.1.9. Material Safety Data Sheets (MSDS).
1.18.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
1.18.2. Post all Material Safety Data Sheets (MSDS) onsite, in a common area, visible to all workers and in locations accessible to tenants when Work of this Contract includes construction activities adjacent to occupied areas.
1.18.3. Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as accepted by the Departmental Representative.

1.19. Meetings
1.19.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
1.19.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
1.19.2.1. Sign-in of all attendees.
1.19.2.2. Planned Work activities and environmental considerations for that shift.
1.19.2.3. Hazards associated with these Work activities, including environmental hazards (eg potential for hypothermia, heat exhaustion, heat stroke).
1.19.2.4. Appropriate job-specific safe work procedures.
1.19.2.5. Required personal protective equipment (PPE).
1.19.2.6. Appropriate emergency procedures.
1.19.2.7. Review recent accidents on Site, including near misses.
1.19.3. Retain records of all health and safety meetings onsite during Work, and retain as corporate records for a minimum of 7 years after Work is completed.

1.20. Correction of Non-Compliance
1.20.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
1.20.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
1.20.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time.
1.20.4. Correct non-compliance.

1.21. Critical Incident Reporting
1.21.1. Critical Incident includes:
1.21.1.1. An event resulting in death or serious injury to employees, client department personnel, contractors or the general public entering or occupying PWGSC facilities. This can include physically or psychologically traumatic events such as natural disasters, hostage takings, terrorism, rape, acts or threats of violence, accidents, suicides or homicides.

1.21.1.2. A fire or explosion causing equipment or property damage or threat to another property.
1.21.1.3. Damage to a boiler or other pressure vessel resulting in fire or rupture of equipment.
1.21.1.4. The free fall of or damage to an elevating device rendering it unserviceable.
1.21.1.5. The uncontrolled release or spill of hazardous wastes or materials.
1.21.1.6. The implementation of rescue, revival or other similar emergency procedures.
1.21.1.7. A structural failure or collapse of a building, tower, crane, hoist, temporary construction support system or excavation.
1.21.1.8. An electric shock, toxic or oxygen deficient atmosphere causing an employee to lose consciousness.
1.21.2. In the event of a Critical Incident, immediate actions include:
1.21.2.1. Contacting emergency services as required (ambulance, fire department, police, environment).
1.21.2.2. Initiating urgently required corrective action appropriate to the incident (protect life, first-aid treatment, minimize property damage, etc.).
1.21.2.3. Contacting the Regional Manager responsible for Safety and Health.
1.21.2.4. Ensuring that evidence on the site is not disturbed until investigations have been completed.
1.21.2.5. Cooperating with officials authorized to investigate the incident.

1.22. Utility Clearance
1.22.1. The Contractor is solely responsible for utility clearance.
1.22.2. The Contractor will not rely upon Drawings or other information provided with utility locations.

1.23. Personal Protective Equipment Program
1.23.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing:
1.23.1.1. Donning and doffing procedures.
1.23.1.2. PPE selection based upon Site hazards.
1.23.1.3. PPE use and limitations of equipment.
1.23.1.4. Work mission duration, PPE maintenance and storage.
1.23.1.5. PPE decontamination and disposal.
1.23.1.6. PPE inspection procedures prior to, during, and after use.
1.23.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
1.23.1.8. Medical surveillance requirements for personnel assigned to work at Site.
1.23.1.9. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
1.23.1.10. Site control measures employed at Site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
1.23.1.11. Decontamination procedures for both personnel and equipment.
1.23.1.12. Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and

follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.

1.23.1.13. Written respiratory protection program for project activities.

1.23.1.14. Procedures dealing with heat and/or cold stress.

1.23.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

1.24. Offsite Contingency and Emergency Response Plan

1.24.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.

1.24.2. Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.

1.25. Personnel Health, Safety, and Hygiene

1.25.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

1.25.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.

1.25.3. Personal Protective Equipment:

1.25.3.1. Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.

1.25.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:

1.25.4.1. Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses onsite within work zones.

1.25.4.2. Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.

1.25.4.3. Dispose of or decontaminate PPE worn onsite at end of each workday.

1.25.4.4. Decontaminate reusable PPE before reissuing.

1.25.4.5. Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

1.25.4.6. Ensure facial hair does not interfere with proper respirator fit.

1.25.5. Respiratory Protection:

1.25.5.1. Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.

1.25.5.2. Develop, implement, and maintain respirator program.

1.25.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.

1.25.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.

1.25.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.

1.25.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.

1.25.5.7. Ensure appropriate respiratory protection during Work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.

1.25.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
1.25.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
1.25.7.1. Suitable containers for storage and disposal of used disposable PPE.
1.25.7.2. Potable water and suitable sanitation facility.
1.25.8. Emergency and First-Aid Equipment:
1.25.8.1. Locate and maintain emergency and first-aid equipment in appropriate location onsite including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
1.25.9. Site Communications:
1.25.9.1. Post emergency numbers near site telephones.
1.25.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
1.25.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
1.25.9.4. Furnish selected personnel with 2-way radios.
1.25.9.5. Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used
3.1.1. Not Used.

END OF SECTION

Part 1 General

1.1 FIRE DEPARTMENT BRIEFING

.1 The Departmental Representative will co-ordinate arrangements for contractor for briefing on Fire Safety at pre-work conference by Fire Chief, if required, before work is commenced. The Colwood Fire Department will respond to calls to the Colwood Base.

1.2 REPORTING FIRES

.1 Know location of nearest fire alarm box and telephone, including emergency phone number.

.2 Report immediately fire incidents to Fire Department as follows:

- .1 Telephone 911.
- .2 Activate nearest fire alarm box.

.3 Person activating fire alarm box will remain at box to direct Fire Department to scene of fire.

.4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

1.3 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

.1 Fire protection and alarm system will not be:

- .1 Obstructed;
- .2 Shut-off; and
- .3 Left inactive at end of working day or shift without authorization from Fire Chief.

.2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Chief.

1.4 FIRE EXTINGUISHERS

.1 Supply fire extinguishers, as indicated in Section 01 35 29.14 – Health and Safety for Contaminated Sites.

1.5 BLOCKAGE OF ROADWAYS

.1 Advise Fire Chief of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Chief, erecting of barricades and digging of trenches.

1.6 SMOKING PRECAUTIONS

.1 Observe smoking regulations.

1.7 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials at minimum quantities.

.2 Burning of rubbish is prohibited.

.3 Removal:

.1 Remove rubbish from work site at end of work day or shift or as directed.

.4 Storage:

.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.

.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove specified.

1.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 Handling, storage and use of flammable and combustible liquids governed by current National Fire Code of Canada.

1.9 QUESTIONS AND/OR CLARIFICATION

.1 Direct questions or clarification on Fire Safety in addition to above requirements to the Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 02 81 01 - Hazardous Materials.

.3 Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.4 Section 01 35 43 - Environmental Procedures.

1.2 REFERENCES

.1 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.

.2 Reference Standards:

.1 British Columbia Environmental Management Act and related Regulations.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.14 - Health and Safety for Contaminated Sites and 01 35 43 - Environmental Procedures.

.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by the 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 training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.

.1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 The EPP shall meet the requirements of Section 02 81 01 - Hazardous Materials.

.12 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.13 A Water Management and Treatment Plan is to be included by the Contractor and meet the requirements of Section 01 11 00 – Summary of Work. Identifies methods and procedures for management and/or discharge of waters which are directly derived from construction activities and dewatering of the site (if required).

.14 A Soil Management Plan to address how all materials will be handled, stockpiled or disposed of during the project, including proposed truck routes (Drawing 2). The plan should address site-specific measure to be taken if visual or olfactory observations during the remediation activities indicate that the materials may be contaminated. Stockpiled materials must be underlain by a rugged, impermeable material (e.g. thick, pre-fabricated liner such as a 60 mil LLPDE liner) to minimize potential tearing and perforating from vehicle traffic and to ensure that excavated material does not come into contact with the underlying soils and that any water generated from the excavated material does not infiltrate the underlying soils. Material in the stockpile management area is to be covered with an impermeable cover (i.e. 6 mil polyethylene cover) nightly, during periods of work stoppage, during periods of high intensity or sustained rainfall, during periods when the stockpiled material is not being actively handled and as directed by the Departmental Representative. It is the Contractor’s responsibility to ensure that the covers are not left off and are adequately weighted down to ensure

the covers are not blown off the stockpiles (e.g. with tires). Excavation activities shall take place in stages to prevent the mixing of materials.

.15 Policies for the reduction of vehicle emissions. Machinery on site shall be in good repair. Minimizing idling time and shut off machinery when not in use. Stockpiled materials shall be placed in the designated stockpile management area (Drawing 2).

.16 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.17 Procedures for addressing animals which may enter the site and methods of reducing animal attractants, which includes not feeding animals, use of animal-proof containers for garbage, and daily removal of garbage from the site.

.18 Provide address and description of proposed approved disposal sites for the disposal of contaminated materials transported from the site.

1.4 DRAINAGE

.1 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 SITE CLEARING AND PLANT PROTECTION

.1 Obtain authorization from the Departmental Representative prior to work near mature trees or other significant natural features.

.2 Protect trees and plants on site and adjacent properties as indicated.

.3 Protect trees and shrubs adjacent to properties as indicated.

.4 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.5 Minimize stripping of topsoil and vegetation.

.6 If tree removal is required, a Departmental Representative will be consulted.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Maintain a spill kit within 20 metres of the work area. The spill kit contents must be contained in a weatherproof container, clearly labelled, and will contain, at all times, a minimum of the following items:

.1 4 pairs nitrile gloves.

.2 4 pairs leather gloves.

.3 2-10’ Oil Only Socks.

.4 15-Polypropylene Sorbent Pads 18”X18”X3/8” (Oil only).

.5 2-10 Quart Cellulose Sorbent Material.

.6 Oil Only, Barrier Tape-Yellow “Caution Do Not Enter”.

.7 Spill Response Card.

.8 List of Kit Contents.

.9 Spill Response Plan.

.5 Oil drip pans will be placed under all equipment when not in use at the site and at all times under stationary equipment (i.e. light standards, heaters, generators).

.6 Ensure no off-site migration of deconstruction materials/soil/dust or odours occur through tracking of soil/deconstruction materials in truck tires or materials handing on-site.

.7 Designate one fuelling area at the site that is acceptable to the Departmental representative and do not fuel equipment outside of that area. The fuelling area shall be > 30 metres away from any drain, watercourse or other pathway that could lead to contamination of a watercourse and on an impervious surface and with appropriate containment and spill control. The fuelling area shall be designated by the Contractor in the EPP for PWGSC approval.

1.7 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 The Environmental Protection Plan must include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and the Departmental Representative. If any historical, archaeological and/or cultural resources are identified then the Contractor must stop work immediately and notify the Departmental Representative. Any historical, archaeological and/or cultural resources remain property of the Crown and must not be removed from the site.

1.8 NOTIFICATION

.1 The Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform the Departmental Representative of proposed corrective action and take such action for approval by the Departmental Representative.

.1 Take action only after receipt of written approval by the Departmental Representative.

.3 The Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.2 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location of site facilities (including washroom facilities), including avenues of ingress / egress.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.5 HOISTING

.1 Provide, operate and maintain cranes required for moving of material and equipment.

.2 Cranes to be operated by qualified operator.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work. The designated Contractor parking/staging area is shown on Drawing 2.

.2 Provide and maintain adequate access to project site.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.8 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign during mobilization, in a location designated by the Departmental Representative.

.2 Indicate on sign, name and contact information of Contractor.

.3 No other signs or advertisements, other than warning signs, are permitted on site.

.4 Signs and notices for safety and instruction to be posted as deemed necessary by the PWGSC Representative.

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by the Departmental Representative.

1.10 OFFICES

.1 Provide office lighted and ventilated, of sufficient size to accommodate site meetings and furnished with drawings laydown table.

.2 Provide office space lighted, ventilated and with 110V power made available for the Departmental Representative to use as a work space, including at minimum a table and chair for the Departmental Representative's use.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices to Departmental Representative for approval.

.4 Clean as outlined in Section 01 74 11 - Cleaning.

.5 Maintain at site office one record copy of:

- .1 General Conditions
- .2 All Permits, Authorizations and Approvals for the proposed works.
- .3 Utility Plans.
- .4 Contract Drawings.
- .5 Specifications.
- .6 Addenda.
- .7 Change Orders and other modifications to Contract.
- .8 Reviewed shop drawings, product data, and samples.
- .9 List of Outstanding Shop Drawings.
- .10 One set of record drawings and Specifications for "as-built" purposes.
- .11 Field and Laboratory Test Reports.
- .12 Copy of Accepted Project Schedule.

.13 Health and Safety Plan and Other Safety Related Documents including daily toolbox or tailgate meetings.

.14 Daily work records to be completed by end of each shift which include:

.1 Quantities for each Description of Work identified in the Unit Price Table and Change Orders.

.2 Description of Work performed.

.3 Current Site conditions.

.4 General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.

.5 Records of on-site (within site) movement of soil.

.6 Records of all material movement onto and off the site, including records (manifests) of waste movement and disposition, and analytical records as need be.

.7 Records of discharged water (i.e. effluent) flow volumes.

.8 Signature of Superintendent and Departmental Representative.

.15 Worksafe BC notice of project, also to be provided to PWGSC prior to mobilization to the site.

.16 Environmental Protection Plan.

.17 Reviewed and accepted submittals.

.18 Manufacturers' installation and application instructions (as appropriate).

.19 National Building Code of Canada (as appropriate).

.20 Current construction standards of workmanship listed in technical Sections (as appropriate).

.21 Final Meeting Minutes, Agendas and associated Attachments.

.22 Other document as specified by the Departmental Representative.

.6 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage. Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.7 Maintain record documents in clean, dry and legible condition in site office. Do not use record documents for construction purposes.

.8 Keep record documents and samples available for inspection the Departmental Representative.

1.11 First Aid

.1 Provide marked and fully stocked first aid case in a readily available location.

1.12 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain lockable storage for tools, equipment and materials.

.2 Locate materials not required on site in manner to cause least interference with work activities.

.3 Storage of any equipment, tools and materials at the site is at the discretion of the Contractor; PWGSC will not be responsible for damaged, vandalized or stolen items.

1.13 SANITARY FACILITIES

.1 Provide and maintain sanitary facilities for work force in accordance with governing regulations and ordinances. Contractor is responsible for regular, scheduled removal and disposal of sanitary waste.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 35 43 - Environmental Procedures.

1.2 PROJECT CLEANLINESS

.1 All equipment must arrive on-site in a clean condition, free of loose dirt and contaminants.

.2 Provide and operate any cleaning equipment necessary to minimize tracking of soil, deconstruction materials and/or contaminants off of the site and along haul routes.

.3 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by sub-contractors.

.4 Remove waste materials from site (other than impacts soil or deconstructed materials) at daily regularly scheduled times or dispose of as directed by the Departmental Representative. Do not burn waste materials on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.6 Provide on-site containers for collection of waste materials and debris.

.7 Provide and use marked separate bins for recycling.

.8 Ensure off-site roadways are maintained in a clean condition so that off-site tracking of soil / deconstruction materials from the site is not evident. Complete daily street sweeping during periods of soil transport (off-site disposal or import of backfill) or as directed by the Departmental Representative.

.9 Meet the requirements of Section 01 35 42 - Environmental Procedures.

1.3 FINAL CLEANING

.1 Remove waste products and debris from the site on a weekly basis (with the exception of deconstruction materials and excavated materials).

.2 Prior to final review remove surplus products, tools, construction machinery and equipment.

.3 Remove waste products and debris including that caused by sub-contractors.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Sweep and wash clean paved areas.

.6 Clean all equipment prior to leaving the site to remove soil, deconstruction materials, and contaminants.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling when possible.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 00.06 - Special Procedures for Traffic Control.

.3 Section 31 00 00.01 – Earthwork – Short Form

.4 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 SUMMARY

.1 Work Includes.

.1 Provision and installation of materials and equipment necessary to complete site preparation activities, remediation and physical restoration.

.2 Completion of all activities in conjunction with and under the supervision of Environmental Monitors and the Departmental Representative.

.3 Identification of subsurface utilities, disconnection of utilities and temporary supply of utilities as required, and, reinstatement of all utilities and infrastructure following excavation.

.4 Implementation of safety work zones, site Health and Safety Plans and Emergency Response Plans, and Environmental Protection Plan.

.5 Construction of water control and recovery structures.

.6 Monitoring ground water quality to ensure that work has no negative impact.

.7 Excavation and stockpiling of contaminated and uncontaminated soil at the soil stockpile area for characterization (Drawing 2).

.8 Co-ordination and supervision of excavation of contaminated soil, including stockpiling for characterization.

.9 Allowing and assisting the Departmental Representative to collect soil samples from the excavations for characterization purposes to confirm that sufficient remediation has taken place.

.10 Stockpiling of soils in approximately 50 m^3 piles, or pile sizes as directed by the Departmental Representative, in the designated area while awaiting characterization, and loading soil from stockpiles into trucks for off-site disposal.

.11 Preparation of temporary stockpile location, including surfacing of access and haul roads if required.

.12 Maintaining erosion and sediment control at the site, including covering stockpiles, and appropriately managing any excavation water.

.13 Traffic control where required to maintain a safe work or traffic area for DND staff and visitors.

.14 Management of contaminated waters generated during soil remediation work, including separation, recovery and elimination of free-phase hydrocarbons.

.15 Loading of, transportation to, and disposal of contaminated soil at licensed and authorized off site treatment or disposal facilities.

.16 Dismantling facilities following acceptance of final report by Departmental Representative.

.17 Backfilling of excavations and covering fill with layer of topsoil.

.18 Hydro seeding the excavation area with a native grass mix following backfilling.

.19 Grading, adding topsoil and hydro seeding the existing access road at the end of the project.

.2 Unit Prices.

.1 Provide costs for soil remediation in the Cost of Services Form provided.

1.3 REFERENCES (Latest Edition)

.1 British Columbia Contaminated Sites Regulation and Hazardous Waste Regulation.

.2 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

1.4 SUBMITTALS

.1 Provide evidence of sufficient insurance to conduct the works described per contract.

.2 Identify subcontractors and provide evidence of appropriate licensing if they are involved with transport of contaminated soils or Hazardous Waste.

.3 Identify the facility(s) that will be used to treat and/or dispose of each of the categories of materials identified. Provide evidence that they are authorized and/or licensed to accept, treat and dispose of the specific category of material. Work will NOT proceed until the Departmental Representative is satisfied the receiving facilities are appropriately qualified and afford PWGSC suitable liability protection.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Stockpiles will be classified within 5 working days (upon receipt at the laboratory) for non-hazardous waste material. If additional testing is required to determine whether the material would be classified as Hazardous Waste then an additional 4 working days will be required. Once classified the soil can be loaded into trucks for transport to the disposal facility, or, if they are classified as non-contaminated, they will be used for backfilling (providing they are geotechnically suitable). If not suitable for geotechnical use on site, the stockpile location will be designated by the Departmental Representative.

.2 The limits of excavation will be marked by the Departmental Representative as a starting point for the Contractor.

.3 In the stockpile staging area the Contractor must:

.1 Install a rugged impermeable liner (e.g. 60 mil LLPDE) liner below the proposed stockpile area to prevent contact with underlying soil.

.2 Provide impermeable tarps (i.e. 6 mil polyethylene cover) capable of covering stockpiled material until Departmental Representative advises the contractor on

handling procedure. The tarps must remain in place at all times and it will be the Contractors responsibility to ensure they are not left off or blown off the stockpiles.

.4 Store non-contaminated soil excavated only on non-contaminated site surface areas. Ensure no contact between non-contaminated excavated soil and drainage or contaminated water or contaminated soil.

1.6 NEW MATERIALS AND EQUIPMENT

.1 Ship, store and preserve in original packaging with manufacturer's seal and label remain intact.

.2 Ensure materials and equipment are not damaged, altered or soiled during shipment, handling and storage.

.3 Transport rejected equipment and materials from work site immediately.

.4 Store materials and equipment according to manufacturer's and supplier's instructions.

.5 Establish quality management system for materials and equipment.

1.7 PROJECT/SITE CONDITIONS

.1 Existing Conditions.

.1 Review the excavation area on Drawings 626399-009, 626399-010 and 626399-012 that summarize the approximate extent of know soil contamination.

1.8 SEQUENCING

.1 Obtain a non-contaminated source of fill prior to starting excavation. Adequate characterization of all materials must be completed and reported to the Departmental Representative prior to transport and placement at the site. Any non-compliant material will be excavated, loaded and transported off-site at the Contractor’s cost.

.2 All other work should be sequenced in consultation with the Departmental Representative.

1.9 EQUIPMENT

.1 Trucks.

.1 Cleaned meticulously between loads of contaminated soil and clean fill.

.2 Cleaned meticulously at end of Work.

.3 Cover truck bodies with tarpaulins during transportation.

.4 Use watertight truck bodies for transporting contaminated soil.

1.10 PROTECTION

.1 General Site Protection.

.1 Keep excavation sites water free throughout work and manage recovered water according to contamination levels.

.2 Protect excavation from rainwater.

.3 Provide temporary structures to divert flow of surface waters for excavation.

1.11 SOIL TRANSPORT

.1 All soil within the identified contaminated zones that exceeds CCME Residential/Parkland Land Usage levels must be removed from the site and be transported to a facility permitted to receive the material quality being disposed of or treated.

1.12 RESTORATION

.1 Restore excavated portions with imported non-contaminated (i.e. must meet CCME Residential/Parkland soil quality guidelines) material and/or with excavated and stockpiled soil classified as “not-contaminated”.

.2 Re-instate surface grading at the site to give the site the same appearance as before remediation work.

.3 Grade, topsoil and hydro seed the existing access road at the end of the project.

.4 Clean permanent access roads of contamination resulting from project activity at request of Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.3 Section 01 35 35 - DND Fire Safety Requirements.

.4 Section 01 35 43 - Environmental Procedures.

1.2 REFERENCES

.1 Definitions:

.1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.2 Reference Standards:

.1 Canadian Environmental Protection Act,1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 British Columbia Environmental Management Act, 2003 (BC EMA 2003)

.1 British Columbia Contaminated Sites Regulation, 1996 (BC CSR 1996)

.2 British Columbia Hazardous Waste Regulation, 1988 (BC HWR 1988)

.3 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.5 National Research Council Canada Institute for Research in Construction (NRC-IRC)

.1 National Fire Code of Canada-[2005].

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit one copy of WHMIS MSDS in accordance with Section 01 35 29.14 - Health and Safety for Contaminated Sites and 01 35 43 - Environmental Procedures to the Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.2 Submit hazardous materials management plan to the Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

.3 Submit photocopy of shipping documents and waste manifests to PWGSC, or the Departmental Representative, when shipping hazardous waste off-site.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.2 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with the Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.4 Smoking is prohibited at the site.

.5 Storage requirements for quantities of hazardous materials and wastes:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment as specified in Section 01 35 43 - Environmental Procedures.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.11 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with the Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to the Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to the Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to the Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.13 Report spills or accidents immediately to the Departmental Representative. Submit a written spill report to the Departmental Representative within 24 hours of incident.

Part 2 Products

2.1 MATERIALS

.1 Description:

.1 Bring on-site only quantities hazardous material required to perform Work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

.1 ASTM International

.1 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.2 Master Municipal Construction Documents (MMCD).

.3 CSA International

.4 DFO Land Development Guidelines for the Protection of Aquatic Habitat (1993).

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work.

.1 Pay costs of relocating services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide, to appropriate geotechnical testing agency, a sample of backfill proposed for use, no later than two weeks before backfilling or filling work. Submit results of testing to the Departmental Representative for review and approval for use on site no later than one week prior to backfilling.

Part 2 Products

2.1 MATERIALS

.1 Topsoil will be imported to the site by the Contractor. Topsoil quality shall meet the ASTM D5268 - 07 Standard Specification for Topsoil Used for Landscaping Purposes. The topsoil must be thermally treated to prevent the importing of invasive species.

.2 “Crushed Granular Sub-base” backfill, as defined by the MMCD Section 02226, will be imported to the site by the Contractor. Do not begin backfilling or filling without approval of the Departmental Representative.

.3 All fill material imported to the site by the contractor will meet the relevant federal soil quality standards and/or guidelines for Residential/Parkland Land Use.

2.2 FILL CHARACTERIZATION AND DOCUMENTATION

.1 Prior to import of any material used for surfacing, backfilling or any other use requiring fill material the Contractor will provide sufficient documentation, as agreed on by the Departmental Representative, to ensure that the imported material meets the Canadian Council of Ministered of the Environment (CCME) Residential/Parkland Land Usage Soil Quality Guidelines and the regional background soil quality estimates for Vancouver Island outlined in the BC Ministry of Environment Protocol 4 for Contaminated Sites – Determining Background Soil Quality.

.2 Environmental characterization of fill material must be conducted in accordance with the following:

.1 British Columbia, Ministry of Environment, Technical Guidance Document #1 - Site Characterization and Confirmation Testing.

.3 Prior to import of any material the Contractor must inform the Departmental Representative of the proposed fill source(s) and identify the nature of current and historical activities conducted at the source.

.4 The Departmental Representative reserves the right to request additional testing of imported material at the source and at the deposit site to satisfy their requirements. All testing will be done at the Contractor's cost.

.5 All materials brought to the site that does not meet the CCME Residential/Parkland guidelines/standards will be removed from the property immediately at the Contractor's cost.

Part 3 Execution

3.1 EXAMINATION

.1 Evaluation and Assessment:

.1 Examine the Detailed Site Investigation Report. Borehole and test pit locations, along with the analytical results are provided on Drawings 626399-005 and 626399-006.

.2 Before commencing work establish locations of all buried services on and adjacent to site.

3.2 PREPARATION

.1 Temporary erosion and sedimentation control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during the Work.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

.2 Protection of in-place conditions:

.1 Keep excavations clean, free of standing water, and loose soil.

.2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to the Departmental Representative's approval.

.3 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. There is potential for hand excavation of contaminated soil around trees and immediate covering of exposed roots.

.4 Protect buried services that are required to remain undisturbed.

.3 Removal:

.1 Remove logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within the excavation footprint. Remove trees only with the Departmental Representative's approval.

3.3 EXCAVATION

.1 The depth of the excavation is not anticipated to encounter the water table; however, surface water may enter the excavation. The Contractor will be responsible for the management (treatment and disposal) of any surface water entering the excavation.

.2 Excavate as required to carry out work.

.1 Excavation taken below depths shown without Departmental Representative's written authorization to be filled with compacted backfill material as required by the Departmental Representative at Contractor's expense.

3.4 FIELD QUALITY CONTROL

.1 Testing of materials and compaction of backfill will be carried out by a third party contractor approved by the Departmental Representative.

.2 Submit to appropriate geotechnical testing agency a 5 kg sample of backfill proposed for use, no later than two weeks before backfilling work. Submit results of testing to PWGSC for review and approval for use on the site no later than one week prior to backfilling.

.3 Do not begin backfilling or filling operations until material has been approved for use by the Departmental Representative.

.4 Not later than 48 hours before backfilling or filling with approved material, notify the Departmental Representative to allow compaction tests to be carried out by the PWGSC approved testing agency.

3.5 BACKFILLING

.1 Backfill in accordance with Section 31 23 33.01 Excavation, Trenching and Backfilling.

3.6 GRADING

.1 The final grade of the site will follow the natural contours of the native non-impacted soil at the site, and backfill will be placed to provide a maximum slope of 1 Horizontal: 1 Vertical as approved by the Departmental Representative.

.2 Current site drainage and seepage in the project area flows north toward the property boundary, and then east. Following completion of the excavation, the contractor will grade the site to maintain the current surface water flow regime.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.14 - Health and Safety for Contaminated Sites.

.3 Section 01 35 43 - Environmental Procedures.

.4 Section 02 61 00.01 - Soil Remediation.

.5 Section 31 00 00.01 - Earthwork – Short Form.

1.2 MEASUREMENT PROCEDURES

.1 Excavated materials will be measured in accordance with the following procedure:

.1 For soil loaded from a stockpile of classified soil, the truck will be weighed at a certified weigh scale station and the weigh scale records will form the weight of measure for the measure of payment.

.2 For backfill materials imported to the site that are subsequently placed and compacted to restore site conditions, each distinct type of material imported will be weighed at a certified scale prior to delivery to the site and the weigh scale records will form the weight of measure for the measure of payment. Backfilling to authorized excavation limits will be measured in tonnes for each type of material specified.

.3 For excavated material that will be stockpiled while awaiting analytical results and classification, for each distinct type of material excavated and then stockpiled the Contractor will:

.1 Fill a truck and/or truck and pup to an agreed upon fill level that represents a specific volume of material.

.2 The truck and/or truck and pup will then transport and deposit the fill in the stockpile management area. The same volume will be placed in the truck and/or truck and pup and the procedure will be repeated until approximately 50 m^3 have been placed in a stockpile. The Departmental Representative will monitor the loading of all trucks and reserves the right to request addition of material if trucks have not been filled to the specified load height. The Departmental Representative and the Contractors representative will agree on stockpile volumes at the end of each day's work.

.3 At the discretion of the Departmental Representative, a minimum of one truck per day will require weighing with the agreed upon fill level to reconcile the estimated volume with the actual weight of the truck.

.4 The volume of all stockpiles will be used to estimate the total volume excavated and will form the measurement for the measure of payment.

.2 Quantities of soil will be scaled for measurement in tonnes, at the full cost to the Contractor, and backed up by certified weigh scale tickets. Volumes will be determined in metric tonnes.

.3 De-watering of the excavation will be completed by the Contractor.

.4 Volumes of backfill brought to the site will be scaled using a certified scale in tonnes, at full cost to the Contractor.

1.3 REFERENCES

.1 Master Municipal Construction Documents (MMCD).

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM D698-[00ae1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3).

.3 Weights and Measurements Act (R.S.C., 1985, c. W-6).

1.4 DEFINITIONS

.1 Excavation classes: one classes of excavation will be recognized; common excavation.

.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 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.6 QUALITY ASSURANCE

.1 Do construction occupational health and safety in accordance with Section 01 35 29.14 - Health and Safety for Contaminated Sites.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling where possible.

.2 Transport contaminated soils to a PWGSC approved, provincially permitted/licensed facility for disposal. Do not transport soil off-Site without approval by the Departmental Representative.

.3 The Contractor will provide the Departmental Representative a copy of all manifests and weigh scale tickets as required by the Contract.

1.8 EXISTING CONDITIONS

.1 Review the existing Detailed Site Investigation summary report attached.

.2 Protect existing surface features from damage while work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

.3 Buried services:

.1 Obtain applicable “Dig Permit” from DND.

.2 Prior to beginning excavation work, notify Departmental Representative and applicable authorities having jurisdiction and establish location and state of use of buried utilities and structures.

.3 All utilities within and immediately surrounding the work area must be located prior to Work through a BC One Call and a private utility locating company to ensure all buried services are properly located. A hydrovac may be required to confirm actual location of all utilities. Completeness and accuracy of any available utility drawings are not guaranteed and the Contractor is responsible for confirming locations of all utilities. Clearly mark utility locations to prevent disturbance during Work.

.4 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.5 Cap off any obsolete/inactive buried services encountered in a manner approved by authorities having jurisdiction.

.6 Protect buried services that are required to remain undisturbed.

.7 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing and re-routing.

.8 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.9 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.10 Record location of maintained, re-routed and abandoned underground lines.

.11 Confirm locations of recent excavations adjacent to area of excavation.

.12 Where required for excavation, cut roots or branches as directed by the Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Aggregate quality: soil, hard, durable material free from organic material, clay lumps or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Greatest dimension to exceed five times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of the following:

.1 Natural sand;

.2 Manufactured sand;

.3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.

.4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:

.1 Crushed rock;

.2 Gravel and crushed gravel composed of naturally formed particles of stone.

Part 3 Execution

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement in roadway neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 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.

3.3 STOCKPILING

.1 Stockpile materials / excavated soils in areas designated by the Departmental Representative.

.1 Stockpile materials in manner to prevent cross-contamination.

.2 Stockpile materials according to soil quality and type of contaminant.

.3 Stockpile granular materials in manner to prevent segregation.

.4 Stockpile in windrows not exceeding 2.5 m in height to allow sampling and positive drainage away from the piles.

.5 Stockpiles are not to exceed 50 m^3 in size.

.6 Stockpiled materials must be underlain by a rugged, impermeable material (e.g. thick, pre-fabricated liner such as a 60 mil LLPDE liner) to minimize potential tearing and perforating from vehicle traffic and to ensure that excavated material does not come into contact with the underlying soils and that any water generated from the excavated material does not infiltrate the underlying soils.

.7 Contaminated and inferred contaminated soil stockpiles will be covered with an impermeable cover (i.e. 6 mil polyethylene cover) when no further material will be added to them. The poly must be weighted in such a manner to prevent it from blowing off the stockpiles or allowing precipitation to infiltrate.

.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.

3.4 DEWATERING

.1 Keep excavations free of water while Work is in progress.

.2 Protect open excavations against flooding and damage due to surface run-off.

.3 Provide necessary treatment facilities to remove suspended solids or other materials before discharging into storm sewers or drainage areas and meet applicable regulations and bylaws.

.4 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures.

.1 Provide and maintain temporary drainage ditches and other diversions outside of the excavation limits as necessary.

3.5 EXCAVATION

.1 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and immediately cover roots with clean soil.

.2 Do not mix top CSR RL+ soil with soil exceeding the HWR standards.

.3 Excavate, load, and transport 2,100 tonnes of petroleum hydrocarbon contaminated soils with concentrations less than the BC HWR standards but greater than the BC CSR Residential land use standards (CSR RL+). Soil is to be transported to a permitted, PWGSC approved, disposal facility. Some of this soil is also contaminated with metals at concentrations greater than the CSR RL standards but less than the BC HWR standards.

.4 Excavate, load and transport 500 tonnes of petroleum hydrocarbon contaminated soils with concentrations greater than the BC HWR standards (BC HWR+).

.5 Do not mix designated CSR RL+ soil with designated BC HWR+ soil.

.6 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by the Departmental Representative.

.7 Restrict vehicle operations directly adjacent to open excavation.

.8 Do not obstruct flow of surface drainage or natural watercourses.

.9 Obtain Departmental Representative approval of completed excavation.

.10 Following removal of designated material, the Departmental Representative will collect confirmatory samples to ensure that all contaminated material has been removed. After the collection of confirmatory samples, the Departmental Representative will survey the sample locations. The Contractor must make clean the bottom and walls of the excavation (including water and other waste material) and provide clear access for the Departmental Representative. Assist the Departmental Representative in collection of samples including provision of equipment and personnel as necessary. In the event that contamination remains, additional material may need to be removed. Any additional work must be approved by PWGSC prior to the commencement of this work. No

standby time will be granted for waiting for confirmatory soil sample results or surveying of sample locations.

3.6 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 The Departmental Representative has inspected and approved excavation extents.

.2 Departmental Representative receives confirmation that the backfill material meets applicable environmental standards.

.3 The Departmental Representative completes the survey of confirmatory samples.

.2 Areas to be backfilled to be free from debris and water.

.3 Contractor must not proceed with backfilling operations unless approved by the Departmental Representative.

.4 Stockpiled materials excavated and classified as non-contaminated (below CCME Residential/Parkland quality) will be used for backfilling if deemed to be geotechnically suitable – excess material disposal will be designated by Departmental Representative. Stockpile backfill materials in areas designated by Departmental Representative. Protect backfill materials from contamination.

.5 Placement and compaction of “Crushed Granular Sub-base” as defined by the MMCD Section 02226.

.1 Place backfill material in no greater than 150 mm lifts or as directed by the Departmental Representative: control moisture content as required to achieve specified density.

.2 Bring the “Crushed Granular Sub-base” to within 0.15 m of final grade. The top 0.15 m is to be filled with topsoil to facilitate site restoration and planting (to be done by others).

.3 Compact each layer or material to 95% modified proctor (ASTM D698) density as verified by the geotechnical consultant. The Departmental Representative will coordinate the geotechnical consultant. Results will be made available to the Departmental Representative in the field. All compaction test locations and elevations will be surveyed by the Contractor and provided to Departmental Representative immediately upon request by PWGSC.

.4 Backfilled material must meet the compaction specification and will be independently tested by the Geotechnical Engineer. In the event of failed compacted test results, additional compacted and related manpower, equipment and supplies required to meet density specification will be completed at full cost of the Contractor.

3.7 RESTORATION

.1 Upon completion of Work, remove waste materials and debris. Correct defects as directed by the Departmental Representative.

.2 Replace topsoil and hydro seed with a native grass mix as directed by the Departmental Representative.

.3 Grade, place topsoil and hydro seed the existing access road with a native grass mix as directed by the Departmental Representative.

.4 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by the Departmental Representative.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

3.8 AS-BUILT SURVEY

.1 The Contractor will be required to provide an as-built survey, completed by the Contractors Surveyor, stamped and sealed by a qualified land surveyor registered in BC, following remediation that at minimum identifies the following:

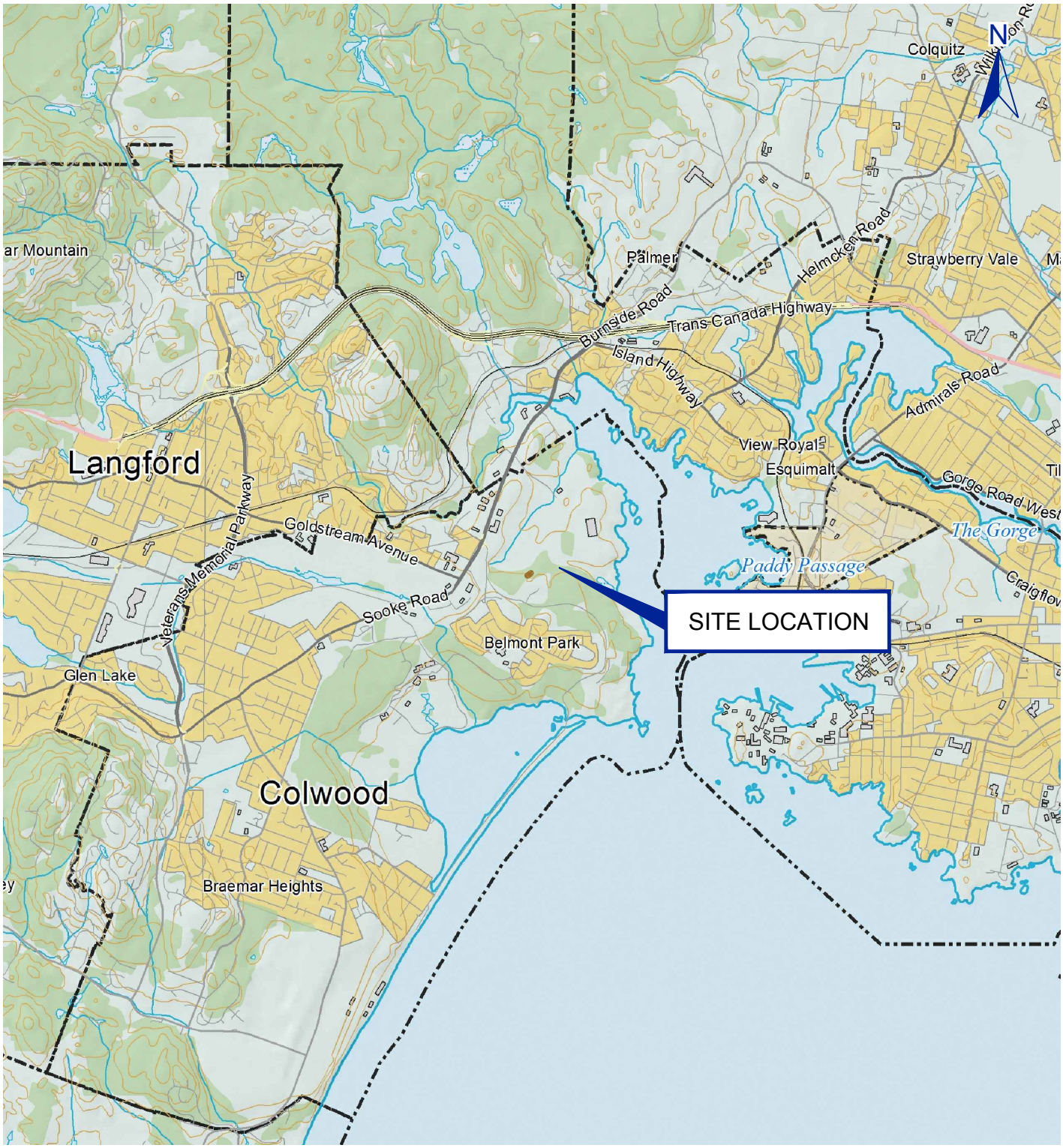
.1 Excavation footprint and topography.

.2 New utility location(s).

.3 Decommissioned and/or abandoned utilities encountered,

.4 Utilities encountered not on current Drawings.

END OF SECTION



REFERENCED FROM: CRD ONLINE MAPPING SYSTEM AND SITE RECONNAISSANCE INFORMATION.

BASEDATA:
© Department of Natural Resources Canada, All rights reserved;
National Road Network, National Railway Network Geobase®,
Downloaded March 2014; Aboriginal Lands, Geobase®,
Downloaded March, 2014; BC regional Districts and Municipalities,
GeoBC,Downloaded March 2014;Fresh Water Atlas,
GeoBC®, Downloade d December 2014

0 0.5 1 2 3 km

SCALE 1:50,000
WHEN PLOTTED CORRECTLY ON A 8.5 x 11 PAGE LAYOUT
NAD 1983 UTM Zone 10N

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SLR
global environmental solutions

PUBLIC WORKS AND GOVERNMENT SERVICES
COLWOOD FOD NORTH AREA
ROSEBANK ROAD
COLWOOD, BC

REMEDIAL SPECIFICATIONS

SITE LOCATION MAP

Date: July 15, 2015	Drawing No. 1
Project No. 205.03738.00000	

Cadfile name: S_205-03738-00000-A1.dwg

NOTES:
REFERENCED FROM: CRD ONLINE MAPPING SYSTEM AND SITE RECONNAISSANCE INFORMATION.

LEGEND:

- PROPERTY BOUNDARY
- SITE ACCESS ROUTE
- APPROXIMATE LIMITS OF EXCAVATION

0 25 50 100 150 200 250 m

SCALE 1:4,000
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT
NAD 1983 UTM Zone 10N

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

PUBLIC WORKS AND GOVERNMENT SERVICES
COLWOOD FOD NORTH AREA
ROSEBANK ROAD
COLWOOD, BC

REMEDIAL SPECIFICATIONS

SITE LAYOUT

Date: July 15, 2015

Project No. 205.03738.00000

Drawing No. 2

SLR global environmental solutions

Cadfile name: S_205-03738-00000-A1.dwg

TP14-13	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-13-01	1.2 – 1.4	–	–	–	–	–	<10	<10	<10[Q]	<STD

MW14-06	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-06-01	0.2 – 0.3	–	–	–	–	–	<10	<10	<10	–
BH14-06-05	4.0 – 4.1	–	–	–	–	–	<10	15	<10	–

TP14-10	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-10-01	0.1 – 0.2	–	–	–	–	–	<10	<10	<10[Q]	–

EXC13-F17	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
EXC13-F17-130308	–	<0.0056	<0.01	<0.02	<0.04	<10	290	6,300	3,300	<0.2[Q]

TP14-08	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-08-02	1.2 – 1.4	–	–	–	–	–	<10	<10	<10[Q]	–

MW14-08	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-08-01	0.3 – 0.5	–	–	–	–	–	<10	14	<10	<STD
BH14-08-02	0.3 – 0.5	–	–	–	–	–	<10	76	44	<STD
BH14-08-05	2.7 – 2.9	–	–	–	–	–	<10	21	<10	–

TP15-02	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	HWOG	PAH
TP15-02-02	0.9 – 1.1	<0.005	0.011	<0.02	<0.04	–	780	4,600	2,400	<0.5	<0.5[Q]
TP15-02-03	0.9 – 1.1	–	–	–	–	–	790	5,200	2,600	–	<0.5[Q]
TP15-02-05	2.9 – 3.0	<0.005	<0.01	<0.02	<0.04	–	33	99	26	–	>STD

TP14-09	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-09-02	1.2 – 1.4	–	–	–	–	–	<10	<10	<10[Q]	<STD

SS14-01	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-01	0.1 – 0.3	–	–	–	–	–	<10	24	21	–
SS14-02	0.1 – 0.3	–	–	–	–	–	<10	26	23	–

EXC13-W9	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
EXC13-W9-130306	0.4	<0.005	0.06	<0.02	0.63	130	34,000	130,000	45,000	>STD

MW14-12	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-12-03	3.2 – 3.5	–	–	–	–	–	<10	13	<10	–

MW14-02	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	HWOG	PAH
BH14-02-02	1.2 – 1.5	0.052	0.66	0.3	4.35	190	8,240	17,600	5,880	4.1*	>STD
BH14-02-03	1.2 – 1.5	0.122	1.42	0.5	8.58	330	11,300	23,200	7,710	5.3*	>STD
BH14-02-04	2.3 – 2.6	–	–	–	–	–	1,810	4,300	1,440	–	>STD

MW14-11	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-11-02	1.7 – 1.8	–	–	–	–	–	<10	<10	<10	<STD
BH14-11-04	3.7 – 3.8	–	–	–	–	–	<10	<10	<10	–

TP14-01	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-01-04	2.4 – 2.6	<0.005	<0.01	<0.05	<0.05	<10	773	9,640	5,590	>STD
TP14-01-05	3.0 – 3.2	–	–	–	–	–	30	290	208	–

TP14-04	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-04-02	1.8 – 2.0	–	–	–	–	–	<10	<10	<10[Q]	–

TP14-03	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-03-02	2.1 – 2.4	–	–	–	–	–	<10	<10	<10[Q]	–
TP14-03-03	2.7 – 3.0	–	–	–	–	–	2,820	10,100	4,260	>STD

TP14-20	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-20-01	0.2 – 0.3	–	–	–	–	–	<10	65	57	–

TP14-15	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-15-02	0.5 – 0.6	–	–	–	–	–	<10	<10	<10[Q]	–

TP14-19	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-19-01	0.0 – 0.2	–	–	–	–	–	23	125	106	–

MW14-04	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-04-02	1.1 – 1.4	–	–	–	–	–	<10	<10	<10[Q]	–

TP14-05	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-05-02	0.5 – 0.6	–	–	–	–	–	<10	21	23	–
TP14-05-03	0.5 – 0.6	–	–	–	–	–	<10	<10	11	–

TP15-01	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	HWOG	PAH
TP15-01-02	0.9 – 1.1	–	–	–	–	–	<10	14	270	–	<STD
TP15-01-03	2.0 – 2.1	0.011	0.17	0.1	1.5	–	2,600	11,000	5,100	<0.5	>STD
TP15-01-04	2.0 – 2.1	0.0087	0.12	0.08	0.97	–	2,300	9,000	4,100	1	>STD

EXC13-W13	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
EXC13-W13-130308	0.2	<0.005	<0.01	<0.02	<0.04	<10	<10	32	13	>STD

TP14-06	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-06-03	1.1 – 1.4	–	–	–	–	–	<10	<10	<10[Q]	–

TP14-02	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-02-02	1.1 – 1.2	–	–	–	–	–	998	18,000	9,120	–

TP14-18	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-18-03	0.9 – 1.1	–	–	–	–	–	<10	<10	<10	–

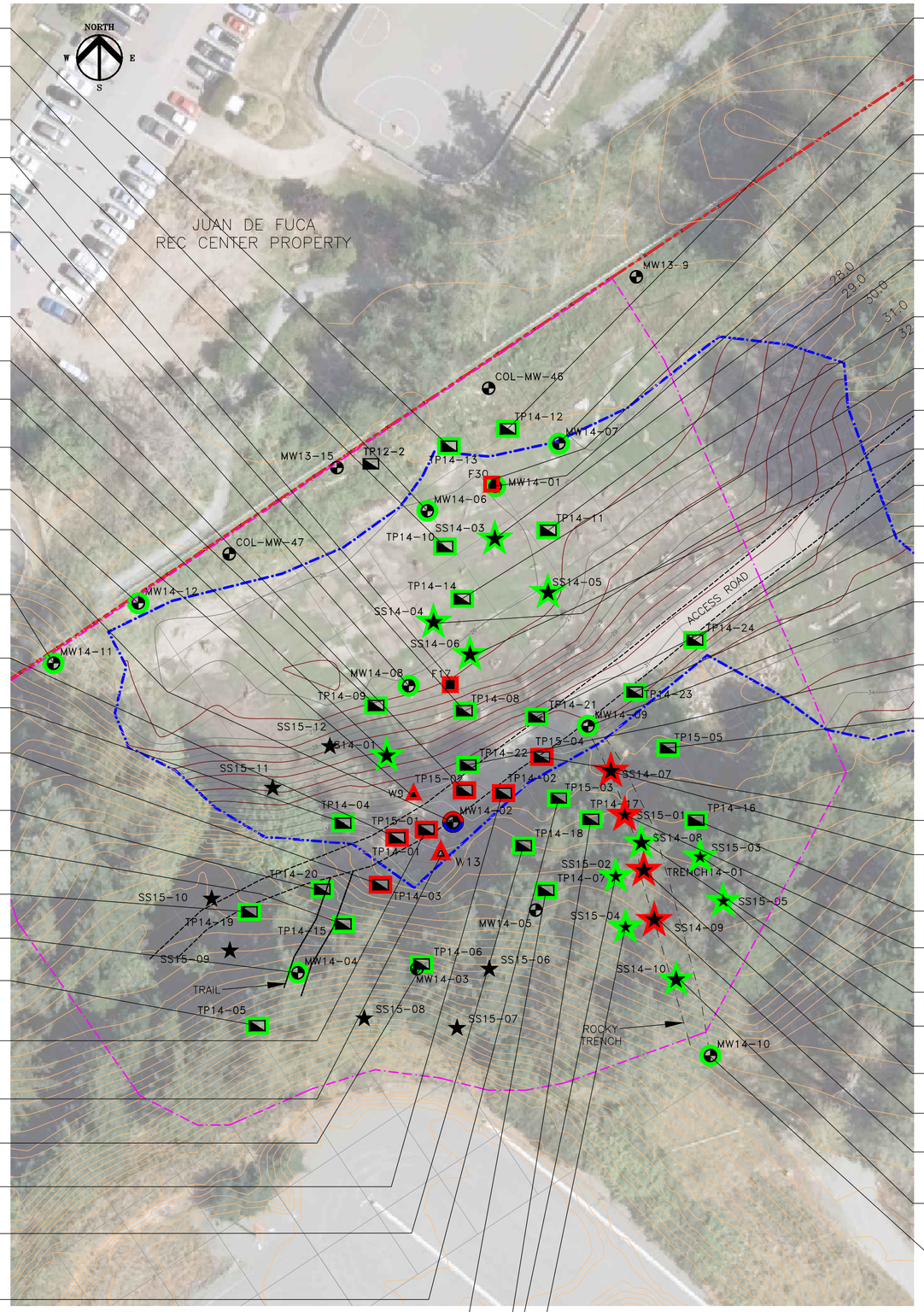
TP15-03	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP15-03-01	0.5 – 0.6	–	–	–	–	–	<10	<10	<10	–
TP15-03-03	2.0 – 2.1	–	–	–	–	–	<10	<10	<10	–

TP14-07	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-07-01	0.9 – 1.1	–	–	–	–	–	<10	<10	<10[Q]	–

TP14-17	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-17-03	0.9 – 1.1	–	–	–	–	–	<10	<10	<10	–

SS15-02	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS15-02	0.1 – 0.3	–	–	–	–	–	<10	17	750	<STD

SS15-04	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS15-04	0.2 – 0.3	–	–	–	–	–	<10	<10	<10	<STD



TP14-12	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-12-01	0.6 – 0.8	<0.005	<0.01[Q]	<0.05	<0.05	<10	<10	12	11	<STD
TP14-12-02	1.5 – 1.7	–	–	–	–	–	<10	<10	<10[Q]	<STD
TP14-12-03	1.5 – 1.7	–	–	–	–	–	<10	<10	<10[Q]	<STD

MW14-07	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-07-01	0.3 – 0.6	–	–	–	–	–	<10	37	28	–
BH14-07-04	2.7 – 2.9	–	–	–	–	–	<10	<10	<10	–

EXC13-F30	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
EXC13-F30-130321	0.0 – 0.1	<0.005	0.016	<0.02	<0.04	15	3,000	13,000	5,100	>STD

MW14-01	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-01-01	0.5 – 0.6	<0.005	<0.01[Q]	<0.05	<0.05	<10	<10	<10	<10[Q]	<STD
BH14-01-03	3.5 – 3.7	<0.005	<0.01	<0.05	<0.05	<10	<10	<10	<10[Q]	<STD

SS14-03	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-03	0.3 – 0.5	–	–	–	–	–	<10	<10	<10	–

TP14-11	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-11-01	0.5 – 0.6	<0.005	<0.01[Q]	<0.05	<0.05	<10	<10	<10	<10[Q]	<STD

TP14-14	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-14-01	0.9 – 1.1	–	–	–	–	–	<10	<10	<10[Q]	–
TP14-14-02	1.7 – 1.8	–	–	–	–	–	<10	<10	<10[Q]	–
TP14-14-03	1.7 – 1.8	–	–	–	–	–	<10	<10	<10[Q]	–

SS14-05	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-05	0.1 – 0.3	–	–	–	–	–	<10	<10	<10	–

SS14-04	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-04	0.6 – 0.7	–	–	–	–	–	<10	22	14	–

SS14-06	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-06	0.1 – 0.3	–	–	–	–	–	<10	<10	<10	–

TP14-24	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-24-01	0.2 – 0.3	–	–	–	–	–	<10	<10	<10	–

TP14-21	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-21-04	2.4 – 2.6	<0.005	<0.01	<0.05	<0.05	<10	<10	<10	<10	<STD

TP14-23	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-23-02	1.4 – 1.5	–	–	–	–	–	<10	<10	<10	–

MW14-09	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-09-02	1.4 – 1.5	–	–	–	–	–	<10	<10	<10	–
BH14-09-03	1.4 – 1.5	–	–	–	–	–	<10	<10	<10	–
BH14-09-05	3.2 – 3.4	<0.005	<0.01	<0.05	<0.05	<10	<10	<10	<10	<STD

TP14-22	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-22-01	0.8 – 0.9	–	–	–	–	–	<10	<10	10	–

TP15-05	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP15-05-01	0.5 – 0.6	–	–	–	–	–	<10	<10	18	–
TP15-05-02	0.9 – 1.1	–	–	–	–	–	<10	<10	<10	–
TP15-05-03	2.0 – 2.1	–	–	–	–	–	<10	<10	<10	–

TP15-04	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH	HWOG
TP15-04-01	0.5 – 0.6	–	–	–	–	–	<10	<10	<10	–	–
TP15-04-02	0.9 – 1.1	–	–	–	–	–	320	12,000	7,800	<0.5[Q]	1.1
TP15-04-03	2.0 – 2.1	–	–	–	–	–	<10	35	34	–	–

SS14-07	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-07	0.2 – 0.3	–	–	–	–	–	<10	326	416	–

TP14-16	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
TP14-16-03	0.8 – 0.9	–	–	–	–	–	<10	<10	<10	–

SS15-01	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS15-01	0.1 – 0.3	–	–	–	–	–	<10	98	1,200	>STD

SS15-03	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS15-03	0.2 – 0.3	–	–	–	–	–	<10	13	22	<STD

SS14-08	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-08	0.4 – 0.6	–	–	–	–	–	<10	16	24	<STD

SS15-05	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS15-05	0.2 – 0.3	–	–	–	–	–	<10	<10	<10	<STD

TRENCH14-1	Depth Range	F2	F3	F4	PAH
TRENCH14-1	1.9	2,180	26,200	12,200	1

SS14-09	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-09	0.8 – 1.0	–	–	–	–	–	<10	32	28	>STD

SS14-10	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
SS14-10	1.4 – 1.6	–	–	–	–	–	<10	28	22	–

MW14-10	Depth Range	B	E	T	X	F1-BTEX	F2	F3	F4	PAH
BH14-10-07	5.3 – 5.5	–	–	–	–	–	<10	<10	<10	<STD
BH14-10-08	5.3 – 5.5	–	–	–	–	–	<10	<10	<10	–
BH14-10-09	6.9 – 7.0	–	–	–	–	–	<10	<10	<10	–

	B	E	T	X	F1-BTEX	F2	F3	F4	HWOG
CCME CEQG RL/PL STANDARDS (µg/g)	0.0068	0.018	0.08	2.4	n/a	n/a	n/a	n/a	n/a
CCME CEQG RLPL FG/CG Surface STANDARDS (µg/g)	0.0068	0.018	0.08	2.4	n/a	n/a	n/a	n/a	n/a
CCME CEQG RL/PL FG/CG Subsoil STANDARDS (µg/g)	0.0068	0.018	0.08	2.4	n/a	n/a	n/a	n/a	n/a
CCME CWS RL/PL FG/CG Surface STANDARDS (µg/g)	0.0068	0.018	0.08	2.4	210	150	300	2,800	n/a
CCME CWS RL/PL FG/CG Subsoil STANDARDS (µg/g)	0.0068	0.018	0.08	2.4	700	230	2,500	10,000	n/a
HWR HWR STANDARDS * (µg/g)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3

[Q] Denotes MDL is greater than the regulatory standard.

DRAFT

LEGEND

0 5 25 METRES

- COLWOOD FORMER FOD NORTH AREA BOUNDARY
- PROPERTY BOUNDARY
- FENCE LINE
- CONTOUR LINES (0.5m INTERVALS)
- 2013 REMEDIATION EXCAVATION LIMIT
- ROAD
- TRENCH
- CURRENT CONTOUR LINES WITHIN 2013 REMEDIATION EXCAVATION LIMIT
- FLOOR SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- WALL SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- INTERIM SAMPLE (PREVIOUS INVESTIGATION)
- MONITORING WELL
- TEST PIT
- SURFACE SAMPLE

B BENZENE
E ETHYLBENZENE
T TOLUENE
X XYLENES
F1-BTEX CCME FRACTION
F2 CCME FRACTION
F3 CCME FRACTION
F4 CCME FRACTION
EPH(C19-C32) EXTRACTABLE PETROLEUM HYDROCARBON
HWOG HAZARDOUS WASTE OIL AND GREASE
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED FOR

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2015-03-27	FOR REVIEW	AJK	AR

SNC·LAVALIN

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT LOCATION: COLWOOD FORMER FOD NORTH AREA CFB ESQUIMALT, COLWOOD, BC

TITLE: DETAILED ANALYTICAL RESULTS FOR SOIL - HYDROCARBONS

DWN BY: PB | SCALE: 1:500 | DATE: 2014-02-05 | DWG No: 626399-005 | REV.: 0

CHK'D: DM | PLOT: 20150327.1000 | CADFILE: 626399C-R1

PATH: \\PROJ_SRV\PROJECTS\CURRENT PROJECTS\PUBLIC WORKS AND GOV'T SERVICES CANADA\626399-DY+COL FOD (DSI, EA, ROA)\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\COLWOOD\626399C-R1.DWG

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W E
S

TP14-13	Depth Range	As	Mo	Ni	SAR	EC
TP14-13-01	1.2 – 1.4	4.7	2.55	23.6	–	–

BH14-06	Depth Range	SAR	EC
BH14-06-01	0.2 – 0.3	5.17	780

TP14-10	Depth Range	As	Mo	Ni	SAR	EC
TP14-10-01	0.1 – 0.2	1.2	0.14	6	–	–

BH14-08	Depth Range	SAR	EC
BH14-08-01	0.3 – 0.5	0.95	540

TP14-09	Depth Range	As	Mo	Ni	SAR	EC
TP14-09-02	1.2 – 1.4	4.1	1.27	29.1	–	–

TP15-02	Depth Range	As	Mo	Ni
TP15-02-02	0.9 – 1.1	6.11	1.71	25.3
TP15-02-03	0.9 – 1.1	6.18	1.74	24.1
TP15-02-05	2.9 – 3.0	4.58	0.78	27

EXC13-W9	Depth Range	As	Mo	Ni	SAR	EC
EXC13-W9-130306	0.4	9.75	5.23	28.4	–	–

BH14-12	Depth Range	SAR	EC
BH14-12-03	3.2 – 3.5	2.11	410

SS15-12	Depth Range	As	Mo	Ni
SS15-12-1	0.3 – 0.5	4.51	0.96	24.5

TP15-01	Depth Range	As	Mo	Ni
TP15-01-02	0.9 – 1.1	20.8	4.88	39.5
TP15-01-03	2.0 – 2.1	28.2	3.06	31.8
TP15-01-04	2.0 – 2.1	29.3	3.99	36

BH14-11	Depth Range	SAR	EC
BH14-11-02	1.7 – 1.8	1.93	360

SS15-11	Depth Range	As	Mo	Ni
SS15-11	0.3 – 0.5	4.78	0.72	28.9

TP14-04	Depth Range	As	Mo	Ni	SAR	EC
TP14-04-02	1.8 – 2.0	6.4	2.49	72.1	–	–

TP14-01	Depth Range	As	Mo	Ni	SAR	EC
TP14-01-04	2.4 – 2.6	7.8	2.31	32.1	–	–
TP14-01-05	3.0 – 3.2	9.4	2.76	36.9	–	–

EXC13-W13	Depth Range	As	Mo	Ni	SAR	EC
EXC13-W13-130308	0.2	18.2	1.66	24.1	0.22	256
EXC13-W13-1-130322	0.0 – 0.1	3.48	1.51	21.7	–	–

SS15-10	Depth Range	As	Mo	Ni
SS15-10	0.2 – 0.4	22.3	8.98	71.4

TP14-03	Depth Range	As	Mo	Ni	SAR	EC
TP14-03-02	2.1 – 2.4	29.1	6.94	37.4	–	–
TP14-03-03	2.7 – 3.0	18.2	4.61	43.2	–	–

SS15-09	Depth Range	As	Mo	Ni
SS15-09	0.2 – 0.4	21.8	4.79	33.4

TP14-15	Depth Range	As	Mo	Ni	SAR	EC
TP14-15-02	0.5 – 0.6	26.9	3.82	21.1	–	–

BH14-04	Depth Range	As	Mo	Ni	SAR	EC
BH14-04-02	1.1 – 1.4	63.3	23.6	34.1	–	–

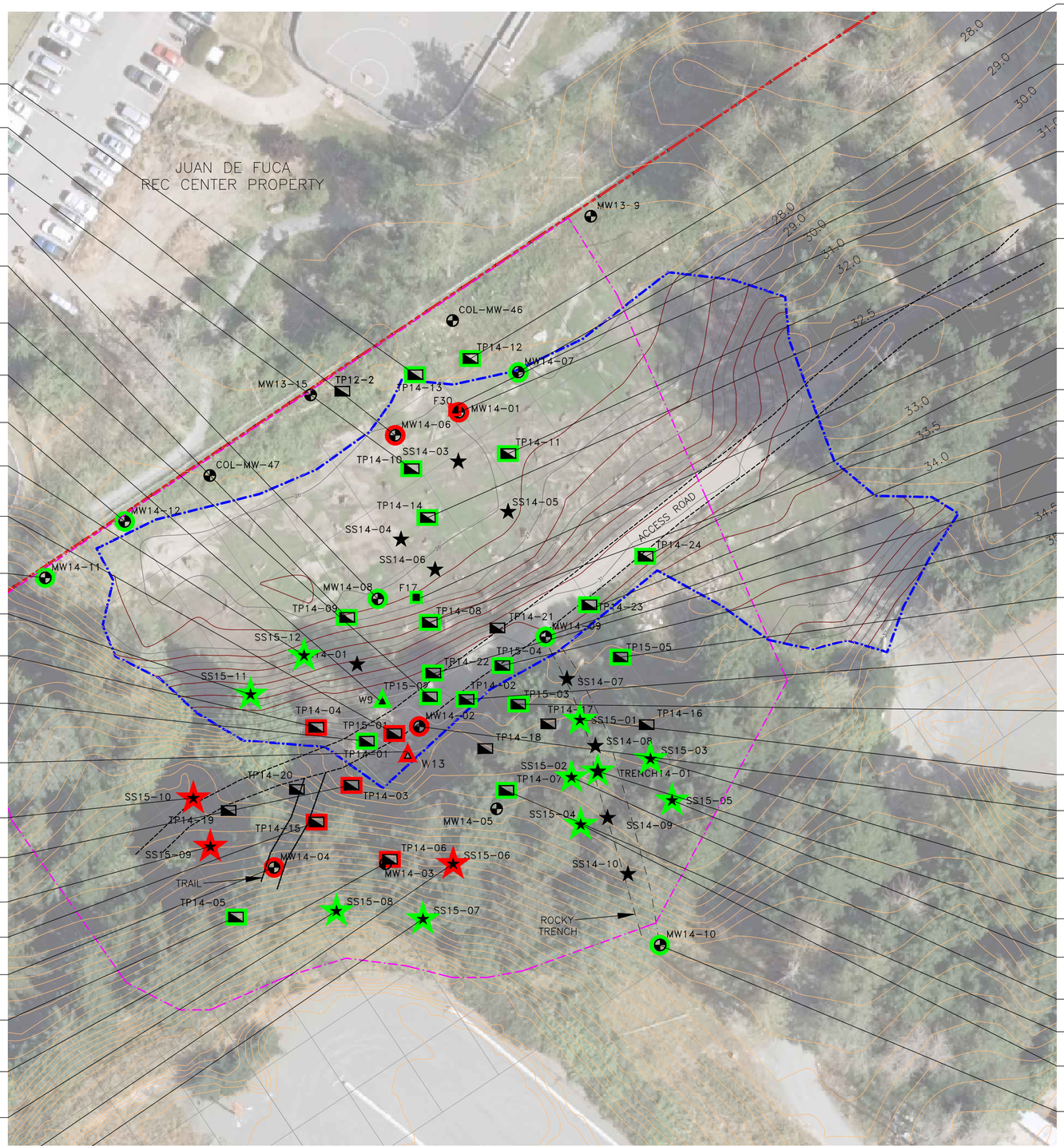
TP14-05	Depth Range	As	Mo	Ni	SAR	EC
TP14-05-02	0.5 – 0.6	6.6	0.82	29.9	–	–
TP14-05-03	0.5 – 0.6	6.4	0.81	33	–	–

TP14-06	Depth Range	As	Mo	Ni	SAR	EC
TP14-06-03	1.1 – 1.4	45.2	3.58	27.6	–	–

SS15-08	Depth Range	As	Mo	Ni
SS15-08	1.0 – 1.2	9.12	0.43	45.1

SS15-06	Depth Range	As	Mo	Ni
SS15-06	0.2 – 0.4	17.5	1.73	27.1

SS15-07	Depth Range	As	Mo	Ni
SS15-07	1.0 – 1.2	6.53	0.34	39.6



TP14-12	Depth Range	As	Mo	Ni	SAR	EC
TP14-12-01	0.6 – 0.8	2.5	4.67	44	–	–
TP14-12-02	1.5 – 1.7	4.9	0.97	31.5	–	–
TP14-12-03	1.5 – 1.7	4.7	0.92	30	–	–

BH14-07	Depth Range	SAR	EC
BH14-07-01	0.3 – 0.6	3.07	760

EXC13-F30	Depth Range	As	Mo	Ni	SAR	EC
EXC13-F30-130321	0.0 – 0.1	16.9	6.55	29.7	7.04	782

BH14-01	Depth Range	As	Mo	Ni	SAR	EC
BH14-01-01	0.5 – 0.6	4.1	0.6	28.8	6.4	960
BH14-01-03	3.5 – 3.7	3.1	<0.5	28.3	1.03	610

TP14-11	Depth Range	As	Mo	Ni	SAR	EC
TP14-11-01	0.5 – 0.6	5.6	8.24	33.1	–	–

TP14-14	Depth Range	As	Mo	Ni	SAR	EC
TP14-14-01	0.9 – 1.1	4.7	1.01	37.9	–	–
TP14-14-02	1.7 – 1.8	5.2	0.38	37.1	–	–
TP14-14-03	1.7 – 1.8	5.6	0.4	40.3	–	–

EXC13-F17	Depth Range	As	Mo	Ni	SAR	EC
EXC13-F17-130308	–	8.72	2.93	28.8	1.71	468

TP14-24	Depth Range	SAR	EC
TP14-24-01	0.2 – 0.3	1.08	200

TP14-08	Depth Range	As	Mo	Ni	SAR	EC
TP14-08-02	1.2 – 1.4	3.9	0.99	24.9	–	–

TP14-23	Depth Range	SAR	EC
TP14-23-02	1.4 – 1.5	0.48	200

BH14-09	Depth Range	SAR	EC
BH14-09-05	3.2 – 3.4	1.05	150

TP14-22	Depth Range	SAR	EC
TP14-22-01	0.8 – 0.9	0.49	310

TP15-04	Depth Range	As	Mo	Ni
TP15-04-01	0.5 – 0.6	3.56	0.9	19.3
TP15-04-02	0.9 – 1.1	4.27	2.4	26.6
TP15-04-03	2.0 – 2.1	6.02	1.53	33.2

TP15-05	Depth Range	As	Mo	Ni
TP15-05-01	0.5 – 0.6	4.64	1.4	25
TP15-05-02	0.9 – 1.1	4.99	1.42	23.4
TP15-05-03	2.0 – 2.1	6.47	2.66	41

TP14-02	Depth Range	As	Mo	Ni	SAR	EC
TP14-02-02	1.1 – 1.2	4.2	1.67	26.3	–	–

TP15-03	Depth Range	As	Mo	Ni
TP15-03-01	0.5 – 0.6	5.07	1.47	23.7
TP15-03-03	2.0 – 2.1	4.54	1.1	23.9

SS15-01	Depth Range	As	Mo	Ni
SS15-01	0.1 – 0.3	6	3.28	27.3

BH14-02	Depth Range	As	Mo	Ni	SAR	EC
BH14-02-02	1.2 – 1.5	9.1	1.5	24.1	11.8	3,370
BH14-02-03	1.2 – 1.5	12.7	1.8	28.1	12.9	3,890
BH14-02-04	2.3 – 2.6	23.4	2.1	44	–	–

SS15-03	Depth Range	As	Mo	Ni
SS15-03	0.2 – 0.3	7.52	0.94	37.8

TRENCH14-1	Depth Range	As	Mo	Ni	SAR	EC
TRENCH14-1	1.9	4.9	1	41.7	–	–

SS15-05	Depth Range	As	Mo	Ni
SS15-05	0.2 – 0.3	10.7	2.32	32.8

SS15-02	Depth Range	As	Mo	Ni
SS15-02	0.1 – 0.3	3.79	0.91	19.7

TP14-07	Depth Range	As	Mo	Ni	SAR	EC
TP14-07-01	0.9 – 1.1	5.6	0.88	24.9	–	–

SS15-04	Depth Range	As	Mo	Ni
SS15-04	0.2 – 0.3	6.27	1.34	27.3

BH14-10	Depth Range	SAR	EC
BH14-10-07	5.3 – 5.5	0.86	660

DRAFT

LEGEND

0 5 METRES 25

- COLWOOD FORMER FOD NORTH AREA BOUNDARY
- PROPERTY BOUNDARY
- FENCE LINE
- CONTOUR LINES (0.5m INTERVALS)
- 2013 REMEDIATION EXCAVATION LIMIT
- ROAD
- TRENCH
- CURRENT CONTOUR LINES WITHIN 2013 REMEDIATION EXCAVATION LIMIT
- FLOOR SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- WALL SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- INTERIM SAMPLE (PREVIOUS INVESTIGATION)
- MONITORING WELL
- TEST PIT
- SURFACE SAMPLE

As ARSENIC
Cu COPPER
Mo MOLYBDENUM
Ni NICKEL
Se SELENIUM
V VANADIUM
SAR SODIUM ADSORPTION RATIO
EC ELECTRICAL CONDUCTIVITY
< DENOTES CONCENTRATION LESS THAN INDICATED DETECTION LIMIT
– NOT ANALYZED FOR

CCME CEQG RL STANDARDS (ug/g)

As	Mo	Ni	SAR	EC
12	10	55*	5	2,000

* CSR PROTOCOL 4 REGIONAL BACKGROUND ESTIMATE

NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2015-03-27	FOR REVIEW	AJK	AR

SNC·LAVALIN

CLIENT NAME: PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

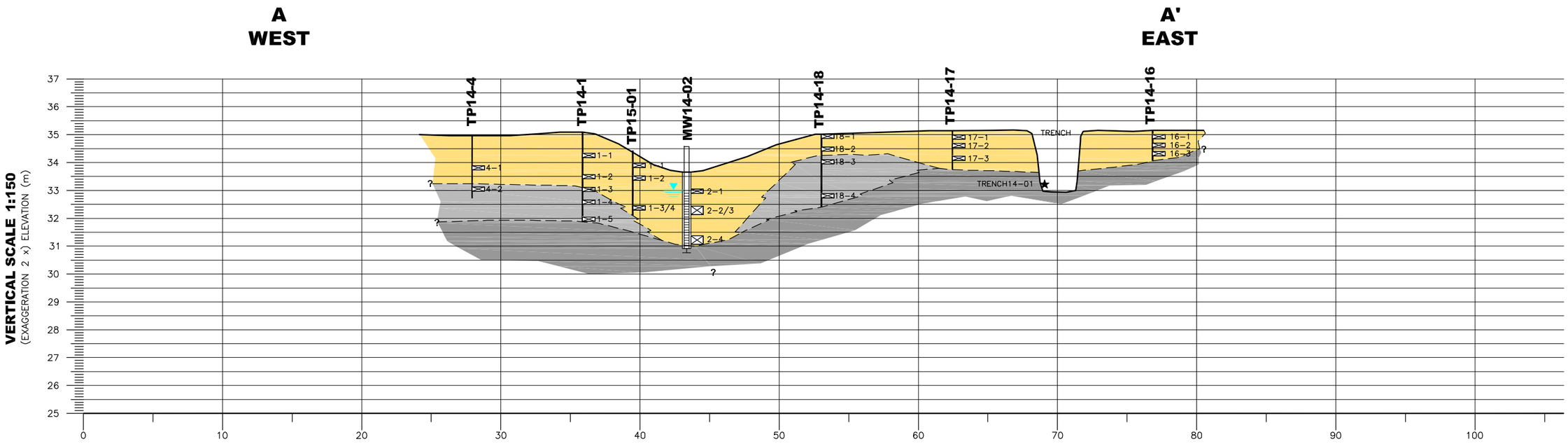
PROJECT LOCATION: COLWOOD FORMER FOD NORTH AREA CFB ESQUIMALT, COLWOOD, BC

TITLE: DETAILED ANALYTICAL RESULTS FOR SOIL - METALS AND SALINITY

DWN BY: PB | SCALE: 1:500 | DATE: 2014-02-05 | DWG No: | REV.: 0

CHK'D: DM | PLOT: 20150327.1000 | CADFILE: 626399C-R1 | 626399-006

PATH: \\PROJ_SRV\PROJECTS\CURRENT PROJECTS\PUBLIC WORKS AND GOV'T SERVICES CANADA\626399-DY+COL FOD (DSI, EA, ROA)\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\COLWOOD\626399C-R1.DWG



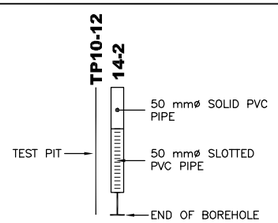
A-A' 003 SECTION

HORIZONTAL SCALE
1:300 (m)

DRAFT

LEGEND

- SILT, SAND, GRAVEL & COBBLES
- SILT/SANDY SILT
- BEDROCK
- INFERRED STRATIGRAPHIC BOUNDARY
- GROUNDWATER ELEVATION MEASURED MARCH 19, 2014



NOTES

1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED. REFER TO PLAN MAP 626399–003 FOR LOCATION OF CROSS SECTION LINE.
2. INFORMATION PRESENTED IS WITHIN 10m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2015–03–27	FOR REVIEW	AJK	DGM

SNC·LAVALIN

CLIENT NAME:
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT LOCATION:
ROSEBANK ROAD
COLWOOD, BC

TITLE:
GEOLOGICAL CROSS SECTION A-A'

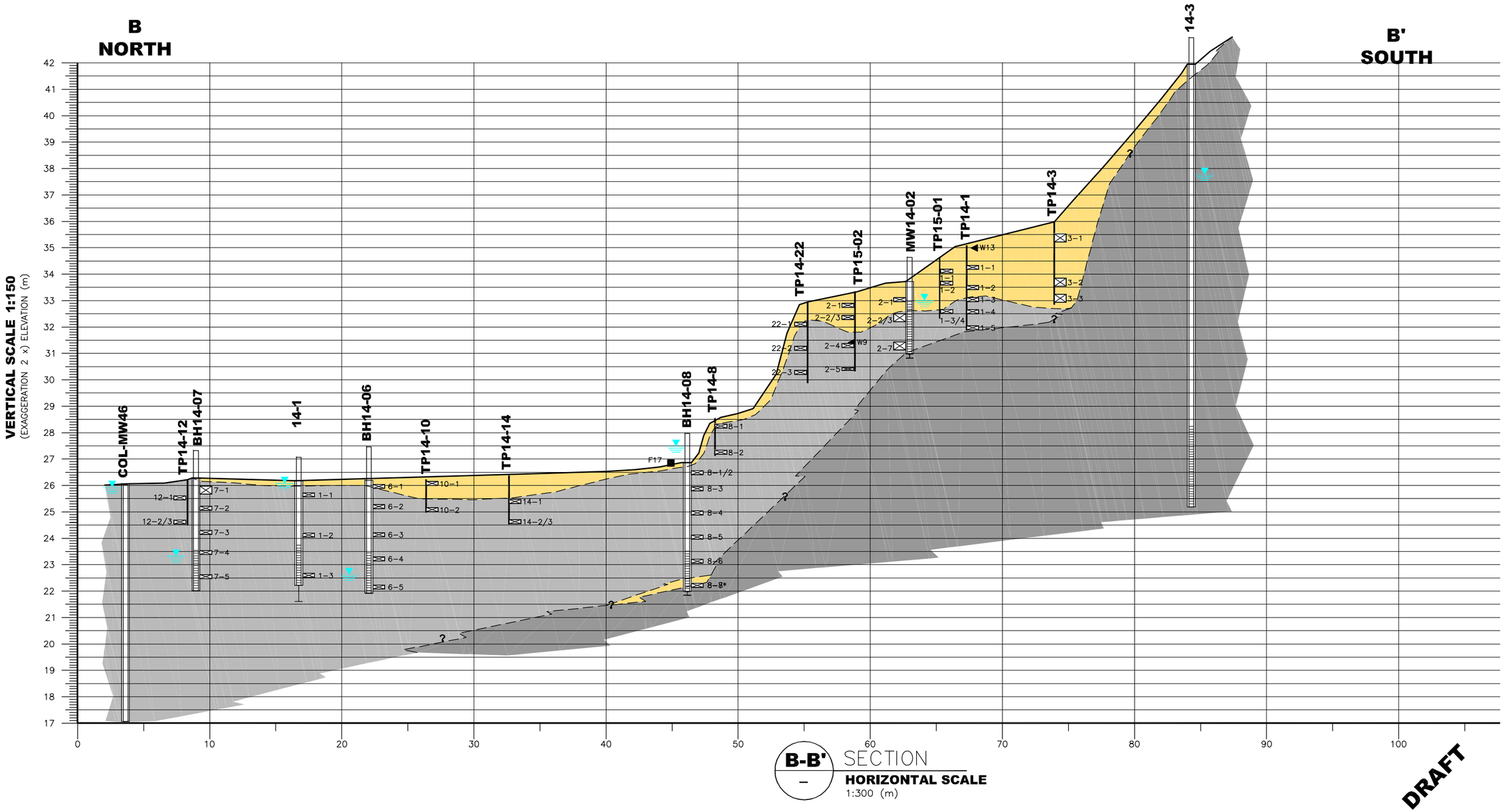
DWN BY: AJK	SCALE: AS SHOWN	DATE: 2014–02–04	DWG No: 626399-009 REV.: 0
CHK'D: DGM	PLOT: 20150327.0658	CADFILE: 626399–XR1	

PATH: \\PROJ_SRV\PROJECTS\CURRENT PROJECTS\PUBLIC WORKS AND GOV'T SERVICES CANADA\626399–DY+COL FOD (DSI, EA, ROA)\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\COLWOOD\626399–XR1.DWG

B
NORTH

B'
SOUTH

VERTICAL SCALE 1:150
(EXAGGERATION 2 x) ELEVATION (m)



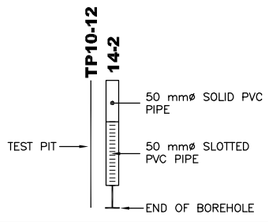
B-B' SECTION
–
HORIZONTAL SCALE
1:300 (m)

DRAFT

LEGEND

- SILT, SAND, GRAVEL & COBBLES
- SILT/SANDY SILT
- BEDROCK
- INFERRED STRATIGRAPHIC BOUNDARY
- GROUNDWATER ELEVATION MEASURED MARCH 19, 2014

BOREHOLE LEGEND



1. THE CROSS SECTION DEPICTED IS BASED ON INTERPRETATION OF LIMITED GEOLOGICAL DATA. ACTUAL GEOLOGICAL CONDITIONS MAY BE DIFFERENT FROM THOSE INTERPRETED. REFER TO PLAN MAP 626399-003 FOR LOCATION OF CROSS SECTION LINE.
2. INFORMATION PRESENTED IS WITHIN 10m OF SECTION LINE UNLESS INDICATED OTHERWISE ON DRAWING. ORIGINAL DRAWING IN COLOUR.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2015-03-27	FOR REVIEW	AJK	DGM

SNC·LAVALIN

CLIENT NAME:
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT LOCATION:
ROSEBANK ROAD
COLWOOD, BC

TITLE:
GEOLOGICAL CROSS SECTION B-B'

DWN BY: AJK	SCALE: AS SHOWN	DATE: 2014-02-04	DWG No: 626399-010 REV.: 0
CHK'D: DGM	PLOT: 20150327.0659	CADFILE: 626399-XR1	

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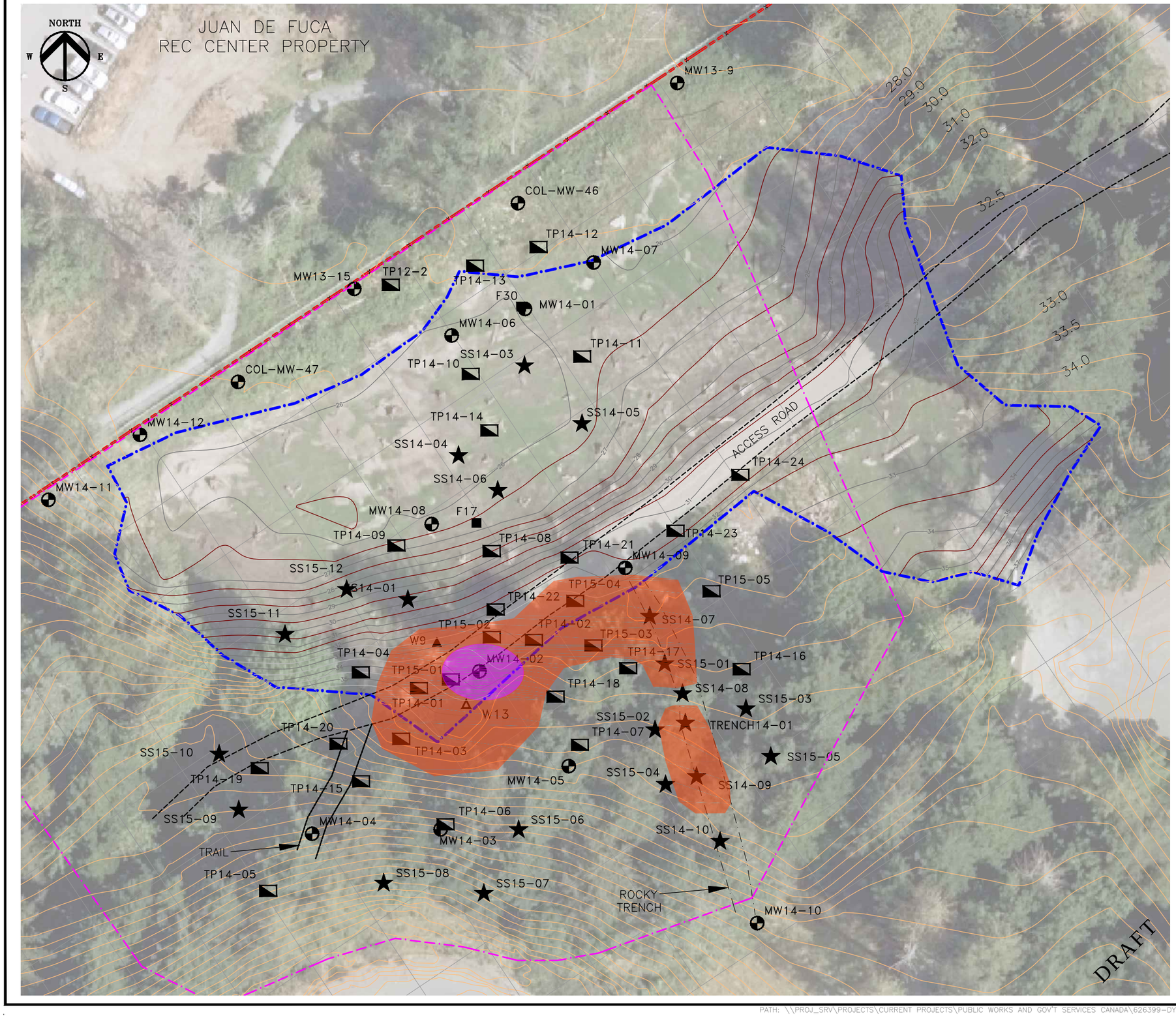

LEGEND

- COLWOOD FORMER FOD NORTH AREA BOUNDARY
- PROPERTY BOUNDARY
- FENCE LINE
- 2013 REMEDIATION EXCAVATION LIMIT
- ROAD
- TRENCH
- CURRENT CONTOUR LINES WITHIN 2013 REMEDIATION EXCAVATION LIMIT
- CONTOUR LINES (0.5m INTERVALS)
- F ■ FLOOR SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- W ▲ WALL SOIL SAMPLE LOCATION (PREVIOUS INVESTIGATION)
- W13 △ INTERIM SAMPLE (PREVIOUS INVESTIGATION)
- MONITORING WELL
- TEST PIT
- SURFACE SOIL SAMPLE
- PETROLEUM HYDROCARBONS AND METALS/SALINITY EXCAVATION AREA
- HAZARDOUS WASTE QUALITY PETROLEUM HYDROCARBONS EXCAVATION AREA

NOTES

1. ORIGINAL DRAWING IN COLOUR.
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REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	–	–

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	2015-03-27	FOR REVIEW	AJK	AR

0 5 METRES 25

SNC·LAVALIN

CLIENT NAME:
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

PROJECT LOCATION:
COLWOOD FORMER FOD NORTH AREA
CFB ESQUIMALT, COLWOOD, BC

TITLE:
PROPOSED EXCAVATION PLAN, REMEDIAL OPTION B

DWN BY: AJK	SCALE: 1:500	DATE: 2015-03-23	DWG No: 626399-012 REV.: 0
CHK'D: WC	PLOT: 20150327.1000	CADFILE: 626399C-R1	

PATH: \\PROJ_SRV\PROJECTS\CURRENT PROJECTS\PUBLIC WORKS AND GOV'T SERVICES CANADA\626399-DY+COL FOD (DSI, EA, ROA)\4.0 EXECUTION\4.5 GIS AND DRAWINGS\CAD\COLWOOD\626399C-R1.DWG

TABLE 1: Soil Sample Log - Surface Samples

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Sample Type [a]	Description	Depth Start (m)	Depth End (m)	Headspace [b] (ppm)
Trench	TRENCH14-1	2014 01 10	SS	GRAVEL, fine to coarse, angular, some silt, some sand, fine grained, black, dense, damp, containing a tar-like substance.	1.8	1.9	10
SS14-01	SS14-01	2014 03 07	SS	SILT, sandy, some gravel, fine to coarse, light brown, soft, loose, wet.	0.1	0.3	0
	SS14-02	2014 03 07	SS	Duplicate of SS14-01-140307.	0.1	0.3	0
SS14-03	SS14-03	2014 03 07	SS	SILT, sandy, trace gravel, fine to coarse, brown with grey mottling, soft, loose, wet.	0.3	0.5	0
SS14-04	SS14-04	2014 03 07	SS	SILT, sandy, trace gravel, fine to coarse, blueish grey, firm, wet.	0.6	0.7	0
SS14-05	SS14-05	2014 03 07	SS	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, trace clay, brown, soft to firm, wet.	0.1	0.3	0
SS14-06	SS14-06	2014 03 07	SS	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, trace clay, brown, soft to firm, wet.	0.1	0.3	0
Trench	SS14-07	2014 03 09	SS	SILT, sandy, some gravel, fine to coarse, brown, soft, loose, moist.	0.2	0.3	0
	SS14-08	2014 03 09	SS	SILT, sandy, some gravel, fine to coarse, brown, soft, loose, moist.	0.4	0.6	0
	SS14-09	2014 03 09	SS	SILT and GRAVEL (FRACTURED BEDROCK), angular, some sand, brown, soft, loose, moist.	0.8	1.0	0
	SS14-10	2014 03 09	SS	SILT, sandy, some gravel (fractured bedrock), grey with brown mottling, soft, loose, moist to wet.	1.4	1.6	0
SS15-01	SS15-01	2015 02 11	SS	SILT, sandy, some gravel, subrounded, brown, firm, moist, trace organics (rootlets).	0.1	0.3	0
SS15-02	SS15-02	2015 02 11	SS	SILT, brown, soft, moist, some organics.	0.1	0.3	0
SS15-03	SS15-03	2015 02 11	SS	SILT and GRAVEL, angular, brown, firm, compact, moist, some organics.	0.2	0.3	0
SS15-04	SS15-04	2015 02 11	SS	SILT, brown/orange, soft, moist, trace organics.	0.2	0.3	0
SS15-05	SS15-05	2015 02 11	SS	SILT, some gravel, angular, brown/orange, soft, moist, trace organics.	0.2	0.3	0
SS15-06	SS15-06	2015 03 11	SS	SILT, light brown, soft, moist, trace organics (rootlets).	0.2	0.4	-
SS15-07	SS15-07	2015 03 11	SS	SILT (FILL), clayey, light brown, soft to firm, moist.	1.0	1.2	-
SS15-08	SS15-08	2015 03 11	SS	SILT (FILL), clayey, light brown, soft to firm, moist.	1.0	1.2	-
SS15-09	SS15-09	2015 03 11	SS	SILT, some gravel, subangular, brown, soft to firm, moist.	0.2	0.4	-
SS15-10	SS15-10	2015 03 11	SS	SILT, sandy, some gravel, subangular, grey/brown, soft, moist.	0.2	0.4	-
SS15-11	SS15-11	2015 03 11	SS	SILT, some sand, some gravel, subangular, brown, soft, wet.	0.3	0.5	-
SS15-12	SS15-12-1	2015 03 11	SS	SILT, some sand, some gravel, subangular, brown, soft, wet.	0.3	0.5	-
	SS15-12-2	2015 03 11	SS	SILT, some sand, some gravel, subangular, brown, soft, wet.	1.0	1.2	-

[a] SS = Surface Sample

[b] Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane standard.

TABLE 2: Summary of Analytical Results for Hydrocarbons in Soil

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	Field Screen[a] (ppm)	Monocyclic Aromatic Hydrocarbons				Petroleum Hydrocarbon Fractions				Gross Parameters					MTBE (µg/g)
					Benzene (µg/g)	Ethyl-benzene (µg/g)	Toluene (µg/g)	Xylenes (µg/g)	F1-BTEX (µg/g)	F2 (>C10-C16) (µg/g)	F3 (>C16-C34) (µg/g)	F4 (>C34-C50) (µg/g)	VPH (C6-C10) (µg/g)	LEPH (C10-C19) (µg/g)	HEPH (C19-C32) (µg/g)	HWR Oil and Grease (%)	HWR Oil and Grease (SG) (%)	
EXC13-W9	EXC13-W9-130306	2013 03 06	0.0 - 0.1	8,250	< 0.005	***0.06***	< 0.02	0.63	130	***34,000***	***130,000***	***45,000***	-	-	-	-	-	-
EXC13-W13	EXC13-W13-130308	2013 03 08	0.0 - 0.1	20	< 0.005	< 0.01	< 0.02	< 0.04	< 10	< 10	32	13	-	-	-	-	-	-
EXC13-F17	EXC13-F17-130308	2013 03 08	0.0 - 0.1	400	< 0.0056	< 0.01	< 0.02	< 0.04	< 10	***290***	***6,300***	***3,300***	-	-	-	-	-	-
EXC13-F30	EXC13-F30-130321	2013 03 21	0.0 - 0.1	350	< 0.005	0.016	< 0.02	< 0.04	15	***3,000***	***13,000***	***5,100***	-	-	-	-	-	-
BH14-01	BH14-01-01	2014 01 09	0.5 - 0.6	65	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	< 10	< 10	-	-	-	-	-	-
	BH14-01-03	2014 01 09	3.5 - 3.7	150	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	< 10	< 10	-	-	-	-	-	-
BH14-02	BH14-02-02	2014 01 09	1.2 - 1.5	70	***0.052***	***0.66***	***0.3***	***4.35***	190	***8,240***	***17,600***	***5,880***	-	-	-	**4.1**	2.5	-
	BH14-02-03	Duplicate	1.2 - 1.5	70	***0.122***	***1.42***	***0.5***	***8.58***	***330***	***11,300***	***23,200***	***7,710***	-	-	-	**5.3**	**3.2**	-
	QA/QC RPD %				81	73	50	65	54	31	28	27	-	-	-	26	25	-
	BH14-02-04	2014 01 09	2.3 - 2.6	105	-	-	-	-	-	***1,810***	***4,300***	1,440	-	-	-	-	-	-
BH14-06	BH14-06-01	2014 03 05	0.2 - 0.3	60	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	BH14-06-05	2014 03 05	4.0 - 4.1	105	-	-	-	-	-	< 10	15	< 10	-	-	-	-	-	-
BH14-07	BH14-07-01	2014 03 05	0.3 - 0.6	80	-	-	-	-	-	< 10	37	28	-	-	-	-	-	-
	BH14-07-04	2014 03 05	2.7 - 2.9	110	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
BH14-08	BH14-08-01	2014 03 05	0.3 - 0.5	0	-	-	-	-	-	< 10	14	< 10	-	-	-	-	-	-
	BH14-08-02	Duplicate	0.3 - 0.5	-	-	-	-	-	-	< 10	76	44	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
	BH14-08-05	2014 03 05	2.7 - 2.9	60	-	-	-	-	-	< 10	21	< 10	-	-	-	-	-	-
BH14-09	BH14-09-02	2014 03 05	1.4 - 1.5	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	BH14-09-03	Duplicate	1.4 - 1.5	-	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
	BH14-09-05	2014 03 05	3.2 - 3.4	220	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	< 10	< 10	-	-	-	-	-	-
BH14-10	BH14-10-07	2014 03 06	5.3 - 5.5	230	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	BH14-10-08	Duplicate	5.3 - 5.5	-	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
	BH14-10-09	2014 03 06	6.9 - 7.0	105	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
Federal Guidelines/Standards																		
CCME CEQG/CWS Residential/Parkland Surface[b,c]					0.0068	0.018	0.08	2.4	210	150	300	2,800	n/a	n/a	n/a	n/a	n/a	n/a
CCME CEQG/CWS Residential/Parkland Subsoil[b,c]					0.0068	0.018	0.08	2.4	700	230	2,500	10,000	n/a	n/a	n/a	n/a	n/a	n/a
BC Standards																		
HWR Hazardous Waste (HWR)					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	n/a

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284, 1486818421, 1486820071.

Associated Maxxam file: B511928.

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SHADOW Concentration greater than or equal to CCME CEQG/CWS Residential/Parkland Subsoil guideline/standard.

SHADED Concentration greater than HWR Hazardous Waste (HWR) standard.

[a] Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane standard.

[b] Guideline/standard for coarse grained and fine grained soil.

[c] The exposure pathway(s) used for determining the standards for this site include: tier 1 - general, direct contact, eco soil contact and management limit (whichever is most stringent).

[d] Concentration has not been corrected for the presence of PAH.

[e] F4 value did not return to baseline and as such F4 Gravimetric (Gravimetric Heavy Hydrocarbons) was completed and reported.

TABLE 2 (Cont'd): Summary of Analytical Results for Hydrocarbons in Soil

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	Field Screen[a] (ppm)	Monocyclic Aromatic Hydrocarbons				Petroleum Hydrocarbon Fractions				Gross Parameters					MTBE (µg/g)
					Benzene (µg/g)	Ethyl-benzene (µg/g)	Toluene (µg/g)	Xylenes (µg/g)	F1-BTEX (µg/g)	F2 (>C10-C16) (µg/g)	F3 (>C16-C34) (µg/g)	F4 (>C34-C50) (µg/g)	VPH (C6-C10) (µg/g)	LEPH (C10-C19) (µg/g)	HEPH (C19-C32) (µg/g)	HWR Oil and Grease (%)	HWR Oil and Grease (SG) (%)	
BH14-11	BH14-11-02	2014 03 06	1.7 - 1.8	195	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	BH14-11-04	2014 03 06	3.7 - 3.8	75	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
BH14-12	BH14-12-03	2014 03 06	3.2 - 3.5	100	-	-	-	-	-	< 10	13	< 10	-	-	-	-	-	-
BH14-04	BH14-04-02	2014 01 10	1.1 - 1.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-01	TP14-01-04	2014 01 07	2.4 - 2.6	50	< 0.005	< 0.01	< 0.05	< 0.05	< 10	***773***	***9,640***	***5,590***	-	-	-	-	-	-
	TP14-01-05	2014 01 07	3.0 - 3.2	20	-	-	-	-	-	30	290	208	-	-	-	-	-	-
TP14-02	TP14-02-02	2014 01 07	1.1 - 1.2	25	-	-	-	-	-	***998***	***18,000***	***9,120***	-	-	-	-	-	-
TP14-03	TP14-03-02	2014 01 07	2.1 - 2.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	TP14-03-03	2014 01 07	2.7 - 3.0	35	-	-	-	-	-	***2,820***	***10,100***	***4,260***	-	-	-	-	-	-
TP14-04	TP14-04-02	2014 01 07	1.8 - 2.0	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-05	TP14-05-02	2014 01 08	0.5 - 0.6	0	-	-	-	-	-	< 10	21	23	-	-	-	-	-	-
	TP14-05-03	Duplicate	0.5 - 0.6	0	-	-	-	-	-	< 10	< 10	11	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
TP14-06	TP14-06-03	2014 01 08	1.1 - 1.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-07	TP14-07-01	2014 01 08	0.9 - 1.1	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-08	TP14-08-02	2014 01 08	1.2 - 1.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-09	TP14-09-02	2014 01 08	1.2 - 1.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-10	TP14-10-01	2014 01 08	0.1 - 0.2	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-11	TP14-11-01	2014 01 08	0.5 - 0.6	0	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	< 10	< 10	-	-	-	-	-	-
TP14-12	TP14-12-01	2014 01 08	0.6 - 0.8	0	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	12	11	-	-	-	-	-	-
	TP14-12-02	2014 01 08	1.5 - 1.7	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	TP14-12-03	Duplicate	1.5 - 1.7	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
TP14-13	TP14-13-01	2014 01 08	1.2 - 1.4	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
Federal Guidelines/Standards																		
CCME CEQG/CWS Residential/Parkland Surface[b,c]					0.0068	0.018	0.08	2.4	210	150	300	2,800	n/a	n/a	n/a	n/a	n/a	n/a
CCME CEQG/CWS Residential/Parkland Subsoil[b,c]					0.0068	0.018	0.08	2.4	700	230	2,500	10,000	n/a	n/a	n/a	n/a	n/a	n/a
BC Standards																		
HWR Hazardous Waste (HWR)					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	n/a

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TABLE 2 (Cont'd): Summary of Analytical Results for Hydrocarbons in Soil

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Depth Interval (m)	Field Screen[a] (ppm)	Monocyclic Aromatic Hydrocarbons				Petroleum Hydrocarbon Fractions				Gross Parameters					MTBE (µg/g)
					Benzene (µg/g)	Ethyl-benzene (µg/g)	Toluene (µg/g)	Xylenes (µg/g)	F1-BTEX (µg/g)	F2 (>C10-C16) (µg/g)	F3 (>C16-C34) (µg/g)	F4 (>C34-C50) (µg/g)	VPH (C6-C10) (µg/g)	LEPH (C10-C19) (µg/g)	HEPH (C19-C32) (µg/g)	HWR Oil and Grease (%)	HWR Oil and Grease (SG) (%)	
TP14-14	TP14-14-01	2014 01 08	0.9 - 1.1	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	TP14-14-02	2014 01 08	1.7 - 1.8	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	TP14-14-03	Duplicate	1.7 - 1.8	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
TP14-15	TP14-15-02	2014 01 08	0.5 - 0.6	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-16	TP14-16-03	2014 03 06	0.8 - 0.9	60	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-17	TP14-17-03	2014 03 06	0.9 - 1.1	105	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-18	TP14-18-03	2014 03 06	0.9 - 1.1	95	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-19	TP14-19-01	2014 03 06	0.0 - 0.2	80	-	-	-	-	-	23	125	106	-	-	-	-	-	-
TP14-20	TP14-20-01	2014 03 06	0.2 - 0.3	75	-	-	-	-	-	< 10	65	57	-	-	-	-	-	-
TP14-21	TP14-21-04	2014 03 06	2.4 - 2.6	105	< 0.005	< 0.01	< 0.05	< 0.05	< 10	< 10	< 10	< 10	-	-	-	-	-	-
TP14-22	TP14-22-01	2014 03 07	0.8 - 0.9	0	-	-	-	-	-	< 10	< 10	10	-	-	-	-	-	-
TP14-23	TP14-23-02	2014 03 07	1.4 - 1.5	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
TP14-24	TP14-24-01	2014 03 07	0.2 - 0.3	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
Trench	TRENCH14-1	2014 01 10	1.8 - 1.9	10	-	-	-	-	-	***2,180***	***26,200***	***12,200***	-	-	-	-	-	-
SS14-01	SS14-01	2014 03 07	0.1 - 0.3	0	-	-	-	-	-	< 10	24	21	-	-	-	-	-	-
	SS14-02	Duplicate	0.1 - 0.3	-	-	-	-	-	-	< 10	26	23	-	-	-	-	-	-
	QA/QC RPD %				-	-	-	-	-	*	*	*	-	-	-	-	-	-
SS14-03	SS14-03	2014 03 07	0.3 - 0.5	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
SS14-04	SS14-04	2014 03 07	0.6 - 0.7	0	-	-	-	-	-	< 10	22	14	-	-	-	-	-	-
SS14-05	SS14-05	2014 03 07	0.1 - 0.3	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
Trench	SS14-06	2014 03 07	0.1 - 0.3	0	-	-	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-
	SS14-07	2014 03 09	0.2 - 0.3	0	-	-	-	-	-	< 10	***326***	416	-	-	-	-	-	-
	SS14-08	2014 03 09	0.4 - 0.6	0	-	-	-	-	-	< 10	16	24	-	-	-	-	-	-
	SS14-09	2014 03 09	0.8 - 1.0	0	-	-	-	-	-	< 10	32	28	-	-	-	-	-	-
Federal Guidelines/Standards																		
CCME CEQG/CWS Residential/Parkland Surface[b,c]					0.0068	0.018	0.08	2.4	210	150	300	2,800	n/a	n/a	n/a	n/a	n/a	n/a
CCME CEQG/CWS Residential/Parkland Subsoil[b,c]					0.0068	0.018	0.08	2.4	700	230	2,500	10,000	n/a	n/a	n/a	n/a	n/a	n/a
BC Standards																		
HWR Hazardous Waste (HWR)					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	n/a

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Trench	SS14-10	2014 03 09	1.4 - 1.6	0	-	-	-	-	-	< 10	28	22	-	-	-	-	-	-
TP15-01	TP15-01-02	2015 02 11	0.9 - 1.1	0	-	-	-	-	-	< 10	14	270[e]	-	< 100	< 100	-	-	-
	TP15-01-03	2015 02 11	2.0 - 2.1	0	***0.011***	***0.17***	***0.1***	1.5	-	***2,600***	***11,000***	***5,100***	65	4,010	9,520	< 0.5	-	< 0.1
	TP15-01-04	Duplicate	2.0 - 2.1	0	***0.0087***	***0.12***	***0.08***	0.97	-	***2,300***	***9,000***	***4,100***	25	6,040	11,400	1	-	< 0.1
	QA/QC RPD %				*	35	*	43	-	12	20	22	*	40	18	*	-	*
TP15-02	TP15-02-02	2015 02 11	0.9 - 1.1	0	< 0.005	0.011	< 0.02	< 0.04	-	***780***	***4,600***	2,400	16	1,390	4,100	< 0.5	-	< 0.1
	TP15-02-03	Duplicate	0.9 - 1.1	0	-	-	-	-	-	***790***	***5,200***	2,600	-	1,420	4,380	-	-	-
	QA/QC RPD %				*	*	*	*	-	1	12	8	*	2	7	*	-	*
	TP15-02-05	2015 02 11	2.9 - 3.0	0	< 0.005	< 0.01	< 0.02	< 0.04	-	33	99	26	< 10	< 100	< 100	-	-	< 0.1
TP15-03	TP15-03-01	2015 02 11	0.5 - 0.6	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100[d]	< 100[d]	-	-	-
	TP15-03-03	2015 02 11	2.0 - 2.1	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100[d]	< 100[d]	-	-	-
TP15-04	TP15-04-01	2015 02 11	0.5 - 0.6	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100[d]	< 100[d]	-	-	-
	TP15-04-02	2015 02 11	0.9 - 1.1	0	-	-	-	-	-	***320***	***12,000***	***7,800***	-	1,200	8,800	1.1	-	-
	TP15-04-03	2015 02 11	2.0 - 2.1	0	-	-	-	-	-	< 10	35	34	-	< 100[d]	< 100[d]	-	-	-
TP15-05	TP15-05-01	2015 02 11	0.5 - 0.6	0	-	-	-	-	-	< 10	< 10	18	-	< 100[d]	< 100[d]	-	-	-
	TP15-05-02	2015 02 11	0.9 - 1.1	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100[d]	< 100[d]	-	-	-
	TP15-05-03	2015 02 11	2.0 - 2.1	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100[d]	< 100[d]	-	-	-
SS15-01	SS15-01	2015 02 11	0.1 - 0.3	0	-	-	-	-	-	< 10	98	1,200[e]	-	< 100	147	-	-	-
SS15-02	SS15-02	2015 02 11	0.1 - 0.3	0	-	-	-	-	-	< 10	17	750[e]	-	< 100	< 100	-	-	-
SS15-03	SS15-03	2015 02 11	0.2 - 0.3	0	-	-	-	-	-	< 10	13	22	-	< 100	< 100	-	-	-
SS15-04	SS15-04	2015 02 11	0.2 - 0.3	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100	< 100	-	-	-
SS15-05	SS15-05	2015 02 11	0.2 - 0.3	0	-	-	-	-	-	< 10	< 10	< 10	-	< 100	< 100	-	-	-
Federal Guidelines/Standards																		
CCME CEQG/CWS Residential/Parkland Surface[b,c]					0.0068	0.018	0.08	2.4	210	150	300	2,800	n/a	n/a	n/a	n/a	n/a	n/a
CCME CEQG/CWS Residential/Parkland Subsoil[b,c]					0.0068	0.018	0.08	2.4	700	230	2,500	10,000	n/a	n/a	n/a	n/a	n/a	n/a
BC Standards																		
HWR Hazardous Waste (HWR)					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	n/a

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n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than or equal to CCME CEQG/CWS Residential/Parkland Surface guideline/standard.

SHADOW Concentration greater than or equal to CCME CEQG/CWS Residential/Parkland Subsoil guideline/standard.

SHADED Concentration greater than HWR Hazardous Waste (HWR) standard.

[a] Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane standard.

[b] Guideline/standard for coarse grained and fine grained soil.

[c] The exposure pathway(s) used for determining the standards for this site include: tier 1 - general, direct contact, eco soil contact and management limit (whichever is most stringent).

[d] Concentration has not been corrected for the presence of PAH.

[e] F4 value did not return to baseline and as such F4 Gravimetric (Gravimetric Heavy Hydrocarbons) was completed and reported.

TABLE 3: Summary of Analytical Results for PAHs in Soil

Sample Location		EXC13-W9	EXC13-W13	EXC13-F17	EXC13-F30	BH14-01		BH14-02				BH14-08			BH14-09	BH14-10	BH14-11	TP14-01	TP14-03	TP14-09	TP14-11	Federal Guidelines
Sample ID		EXC13-W9-130306	EXC13-W13-130308	EXC13-F17-130308	EXC13-F30-130321	BH14-01-01	BH14-01-03	BH14-02-02	BH14-02-03	QA/QC	BH14-02-04	BH14-08-01	BH14-08-02	QA/QC	BH14-09-05	BH14-10-07	BH14-11-02	TP14-01-04	TP14-03-03	TP14-09-02	TP14-11-01	CCME CEQG
Sample Date (yyyy mm dd)		2013 03 06	2013 03 08	2013 03 08	2013 03 21	2014 01 09	2014 01 09	2014 01 09	Duplicate	RPD %	2014 01 09	2014 03 05	Duplicate	RPD %	2014 03 05	2014 03 06	2014 03 06	2014 01 07	2014 01 07	2014 01 08	2014 01 08	Residential/
Depth Interval (m)		0.0 - 0.1	0.0 - 0.1	0.0 - 0.1	0.0 - 0.1	0.5 - 0.6	3.5 - 3.7	1.2 - 1.5	1.2 - 1.5		2.3 - 2.6	0.3 - 0.5	0.3 - 0.5		3.2 - 3.4	5.3 - 5.5	1.7 - 1.8	2.4 - 2.6	2.7 - 3.0	1.2 - 1.4	0.5 - 0.6	Parkland
Field Screen (ppm)		8,250	20	400	350	65	150	70	70		105	0	-		220	230	195	50	35	0	0	Land Use
Parameter	**Units**	**Analytical Results**																				(RL/PL)
Polycyclic Aromatic Hydrocarbons																						
Naphthalene	µg/g	***6.9***	***0.02***	< 0.1[a]	< 0.1[a]	< 0.005	0.006	***18.7***	***25.6***	31	***2.11***	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	***0.1***	***4***	< 0.01	< 0.01	0.013
1-Methylnaphthalene	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	16	< 0.01	< 0.01	n/a
2-Methylnaphthalene	µg/g	51	< 0.02	< 0.2	0.42	< 0.005	0.017	77.3	105	30	5.66	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	0.2	15	< 0.01	< 0.01	n/a
Acenaphthylene	µg/g	< 0.38	< 0.005	< 0.05	< 0.18	< 0.005	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	< 0.1	< 1	< 0.01	< 0.01	320
Acenaphthene	µg/g	< 20[a]	0.0094	< 0.05	< 0.78[a]	< 0.005	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	< 0.1	< 1	< 0.01	< 0.01	0.28
Fluorene	µg/g	***14***	< 0.02	< 0.04	***1.9***	< 0.02	< 0.02	***7.01***	***9.38***	29	***2.24***	< 0.02	< 0.02	*	< 0.02	< 0.02	< 0.02	< 0.2	***2***	< 0.02	< 0.02	0.25
Phenanthrene	µg/g	***43***	***0.18***	< 0.2[a]	***2.7***	< 0.02	0.02	***12.3***	***17.1***	33	***4.48***	< 0.02	< 0.02	*	< 0.02	< 0.02	< 0.02	< 0.2[a]	***6***	< 0.02	< 0.02	0.046
Anthracene	µg/g	***6.9***	0.0049	< 0.06	0.64	< 0.004	< 0.004	< 0.004	< 0.004	*	< 0.004	< 0.004	< 0.004	*	< 0.004	< 0.004	< 0.004	< 0.2	< 2	< 0.02	< 0.02	2.5
Fluoranthene	µg/g	7.2	0.24	< 0.2	0.63	< 0.01	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.01	< 0.01	< 0.5	< 5	< 0.05	< 0.05	15.4
Pyrene	µg/g	***34***	0.18	< 0.2	2.9	< 0.01	< 0.01	4.32	5.21	19	1.2	< 0.01	< 0.01	*	< 0.01	< 0.01	< 0.01	0.7	5	< 0.02	< 0.02	7.7
Benzo(a)anthracene	µg/g	***5.2***	0.036	< 0.2	0.56	< 0.03	< 0.03	0.78	***1.38***	56	0.23	< 0.03	< 0.03	*	< 0.03	< 0.03	< 0.03	< 0.2	< 2[a]	< 0.02	< 0.02	1
Chrysene	µg/g	***20***	0.11	< 0.2	1.8	< 0.05	< 0.05	3.4	4.12	19	0.9	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	< 0.5	< 5	< 0.05	< 0.05	6.2
Benzo(b)fluoranthene	µg/g	< 1.9	0.13	< 0.2	0.22	< 0.05	< 0.05	0.26	0.33	24	0.08	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	0.2	< 2	< 0.02	< 0.02	6.2
Benzo(j)fluoranthene	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Benzo(k)fluoranthene	µg/g	***1.5***	0.045	< 0.05	< 0.2	< 0.05	< 0.05	0.06	0.12	*	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	< 0.2	< 2[a]	< 0.02	< 0.02	1
Benzo(a)pyrene	µg/g	***3.9***	0.07	< 0.2	0.34	< 0.03	< 0.03	0.55	***0.7***	24	0.14	< 0.03	< 0.03	*	< 0.03	< 0.03	< 0.03	< 0.5	< 5[a]	< 0.05	< 0.05	0.6
Indeno(1,2,3-cd)pyrene	µg/g	0.88	< 0.05	< 0.5	< 0.5	< 0.05	< 0.05	0.14	< 0.05	*	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	< 0.2	< 2[a]	< 0.02	< 0.02	1
Dibenz(a,h)anthracene	µg/g	< 0.23	< 0.05	< 0.5	< 0.5	< 0.005	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	*	< 0.005	< 0.005	< 0.005	< 0.2	< 2[a]	< 0.02	< 0.02	1
Benzo(g,h,i)perylene	µg/g	1.9	< 0.05	< 0.5	< 0.5	< 0.05	< 0.05	0.25	0.26	4	0.06	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	< 0.5	< 5	< 0.05	< 0.05	n/a
IACR Coarse	None	52[b]	1.6[b]	2.6[b]	6.7[b]	< 0.05	< 0.05	0.981	1.49	*	0.221	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	-	-	-	-	n/a
IACR Fine	None	52[b]	1.6[b]	2.6[b]	6.7[b]	< 0.05	< 0.05	1.9	2.89	*	0.426	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	-	-	-	-	n/a
B(a)P TPE	µg/g	5.1	0.12	0.4	0.72	0.027	0.027	0.713	0.9318	27	0.1881	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.05	0.405	3.95	0.0395	0.0395	5.3

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284, 1486818421, 1486820071.

Associated Maxxam file: B511928.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

[a] Laboratory detection limit exceeds regulatory standard.

[b] Only one IACR provided, shown in both coarse and fine rows.

TABLE 3 (Cont'd): Summary of Analytical Results for PAHs in Soil

Sample Location		TP14-12				TP14-13	TP14-21	Trench			TP15-01				TP15-02				TP15-04	SS15-01	SS15-02	SS15-03	SS15-04	SS15-05	Federal Guidelines
Sample ID		TP14-12-01	TP14-12-02	TP14-12-03	**QA/QC**	TP14-13-01	TP14-21-04	TRENCH14-1	SS14-08	SS14-09	TP15-01-02	TP15-01-03	TP15-01-04	**QA/QC**	TP15-02-02	TP15-02-03	**QA/QC**	TP15-02-05	TP15-04-02	SS15-01	SS15-02	SS15-03	SS15-04	SS15-05	CCME CEQG
Sample Date (yyyy mm dd)		2014 01 08	2014 01 08	Duplicate	**RPD %**	2014 01 08	2014 03 06	2014 01 10	2014 03 09	2014 03 09	2015 02 11	2015 02 11	Duplicate	**RPD %**	2015 02 11	Duplicate	**RPD %**	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	Residential/
Depth Interval (m)		0.6 - 0.8	1.5 - 1.7	1.5 - 1.7		1.2 - 1.4	2.4 - 2.6	1.8 - 1.9	0.4 - 0.6	0.8 - 1.0	0.9 - 1.1	2.0 - 2.1	2.0 - 2.1		0.9 - 1.1	0.9 - 1.1		2.9 - 3.0	0.9 - 1.1	0.1 - 0.3	0.1 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	Parkland
Field Screen (ppm)		0	0	0		0	105	10	0	0	0	0	0		0	0		0	0	0	0	0	0	0	Land Use
Parameter	**Units**	**Analytical Results**																							(RL/PL)
Polycyclic Aromatic Hydrocarbons																									
Naphthalene	µg/g	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.005	< 0.05[a]	< 0.01	0.01	< 0.01	***1.8***	***3.6***	67	< 0.5[a]	< 0.5[a]	*	***0.014***	< 0.5[a]	***0.03***	< 0.01	< 0.01	< 0.01	< 0.01	0.013
1-Methylnaphthalene	µg/g	< 0.01	< 0.01	< 0.01	*	< 0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
2-Methylnaphthalene	µg/g	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.005	0.07	< 0.01	< 0.01	< 0.05	7.9	15	62	< 0.5	0.57	*	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	n/a
Acenaphthylene	µg/g	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.005	< 0.05	< 0.01	< 0.01	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	320
Acenaphthene	µg/g	< 0.01	< 0.01	< 0.01	*	< 0.01	< 0.005	< 0.05	< 0.01	< 0.01	< 0.05	< 0.5[a]	< 0.5[a]	*	< 0.5[a]	< 0.5[a]	*	< 0.05	< 0.5[a]	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.28
Fluorene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.02	< 0.2	< 0.02	< 0.02	< 0.05	***1.2***	***2.2***	59	< 0.5[a]	< 0.5[a]	*	< 0.05	< 0.5[a]	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.25
Phenanthrene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.02	< 0.2[a]	< 0.02	***0.12***	< 0.02	***2.4***	***4.7***	65	< 0.5[a]	< 0.5[a]	*	***0.065***	< 0.5[a]	***0.29***	0.034	< 0.02	< 0.02	< 0.02	0.046
Anthracene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.004	< 0.04	< 0.02	< 0.02	< 0.05	0.59	1	*	< 0.5	< 0.5	*	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.5
Fluoranthene	µg/g	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.01	< 0.1	< 0.05	0.15	< 0.05	< 0.5	0.7	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.45	< 0.05	< 0.05	< 0.05	< 0.05	15.4
Pyrene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.01	5.2	0.02	0.12	< 0.05	1.9	2.8	-	< 0.5	< 0.5	*	< 0.05	< 0.5	0.35	< 0.05	< 0.05	< 0.05	< 0.05	7.7
Benzo(a)anthracene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.03	< 0.3	< 0.02	0.02	< 0.05	< 0.5	0.54	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.089	< 0.05	< 0.05	< 0.05	< 0.05	1
Chrysene	µg/g	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.05	2.9	< 0.05	0.07	< 0.05	0.79	1.2	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.21	< 0.05	< 0.05	< 0.05	< 0.05	6.2
Benzo(b)fluoranthene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.05	0.5	< 0.02	0.05	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.16	< 0.05	< 0.05	< 0.05	< 0.05	6.2
Benzo(j)fluoranthene	µg/g	-	-	-	-	-	-	-	< 0.02	0.03	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.26	< 0.05	< 0.05	< 0.05	< 0.05	n/a
Benzo(k)fluoranthene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.05	< 0.5	< 0.02	0.03	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.09	< 0.05	< 0.05	< 0.05	< 0.05	1
Benzo(a)pyrene	µg/g	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.03	***1***	< 0.05	0.05	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.16	< 0.05	< 0.05	< 0.05	< 0.05	0.6
Indeno(1,2,3-cd)pyrene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.05	< 0.5	< 0.02	0.03	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.11	< 0.05	< 0.05	< 0.05	< 0.05	1
Dibenz(a,h)anthracene	µg/g	< 0.02	< 0.02	< 0.02	*	< 0.02	< 0.005	0.17	< 0.02	< 0.02	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1
Benzo(g,h,i)perylene	µg/g	< 0.05	< 0.05	< 0.05	*	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	*	< 0.5	< 0.5	*	< 0.05	< 0.5	0.16	< 0.05	< 0.05	< 0.05	< 0.05	n/a
IACR Coarse	None	-	-	-	-	-	< 0.05	0.885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
IACR Fine	None	-	-	-	-	-	< 0.05	1.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
B(a)P TPE	µg/g	0.0395	0.0395	0.0395	*	0.0395	< 0.05	1.3165	0.0405	0.07695	0.063	0.6354	0.6685	*	0.63	0.63	*	0.063	0.63	0.2596	0.063	0.063	0.063	0.063	5.3

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284, 1486818421, 1486820071.

Associated Maxxam file: B511928.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

[a] Laboratory detection limit exceeds regulatory standard.

[b] Only one IACR provided, shown in both coarse and fine rows.

TABLE 4: Summary of Analytical Results for Metals in Soil

Sample Location		EXC13-W9	EXC13-F17	EXC13-F30	EXC13-W13	BH14-01		BH14-02				BH14-04	TP14-01		TP14-02	TP14-03		TP14-04	Federal Guidelines
Sample ID		EXC13-W9-130306	EXC13-F17-130308	EXC13-F30-130321	EXC13-W13-130308	BH14-01-01	BH14-01-03	BH14-02-02	BH14-02-03	QA/QC	BH14-02-04	BH14-04-02	TP14-01-04	TP14-01-05	TP14-02-02	TP14-03-02	TP14-03-03	TP14-04-02	CCME CEQG
Sample Date (yyyy mm dd)		2013 03 06	2013 03 08	2013 03 21	2013 03 08	2014 01 09	2014 01 09	2014 01 09	Duplicate	RPD %	2014 01 09	2014 01 10	2014 01 07	2014 01 07	2014 01 07	2014 01 07	2014 01 07	2014 01 07	Residential/ Parkland Land Use
Depth Interval (m)		0.0 - 0.1	0.0 - 0.1	0.0 - 0.1	0.0 - 0.1	0.5 - 0.6	3.5 - 3.7	1.2 - 1.5	1.2 - 1.5		2.3 - 2.6	1.1 - 1.4	2.4 - 2.6	3.0 - 3.2	1.1 - 1.2	2.1 - 2.4	2.7 - 3.0	1.8 - 2.0	
Parameter	**Units**	**Analytical Results**																	**(RL/PL)**
Physical Parameters																			
pH	pH	7.39	7.04	***8.07***	7.27	7.67	***8.31***	7.72	7.62	1	7.52	7.38	7.3	7.8	7.1	7.9	7.7	7.8	6 - 8
Total Metals																			
Antimony	µg/g	0.26	0.27	0.38	0.78	< 0.5	< 0.5	< 0.5	< 0.5	*	< 0.5	3.5	0.62	0.4	0.19	1.32	0.83	0.4	20
Arsenic	µg/g	9.75	8.72	***16.9***	***18.2***	4.1	3.1	9.1	***12.7***	33	***23.4***	***63.3***	7.8	9.4	4.2	***29.1***	***18.2***	6.4	12
Barium	µg/g	48.6	68.7	75.6	83.2	76.3	53.3	63.7	80.8	24	44.8	24.8	87.5	117	74	111	124	64.6	500
Beryllium	µg/g	< 0.4	< 0.4	< 0.4	< 0.4	< 0.5	< 0.5	< 0.5	< 0.5	*	< 0.5	< 0.5	0.34	0.46	0.3	0.48	0.44	0.37	4
Boron (Hot Water Soluble)	µg/g	-	-	-	-	< 0.5	< 0.5	1.3	1.4	*	< 0.5	< 0.5	1.4	0.3	0.8	0.4	0.7	0.1	n/a
Cadmium	µg/g	0.517	0.352	0.47	0.565	< 0.5[a]	< 0.5[a]	< 0.5[a]	< 0.5[a]	*	< 0.5[a]	1.8	0.37	0.37	0.22	1.05	0.87	0.35	10
Chromium	µg/g	14.2	33.2	27.5	25.5	35.3	31.2	22.9	27.8	19	58.6	17.7	28	41	23	35	40	38	90[a]
Cobalt	µg/g	7.97	11.1	12	11.3	11.6	10.4	8.9	9.7	9	26.8	22	11.2	17.5	9	21.4	20.4	15.2	50
Copper	µg/g	28.4	29.9	36.2	35.7	33.4	27.3	25.9	30.2	15	150	65.7	32.4	62	19	90.5	108	49	150[c]
Lead	µg/g	106	39.1	69.4	21.1	3.8	3.5	25.8	26.6	3	8.4	5.1	38	6	27.7	7.4	35.8	4.3	140
Lithium	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Manganese	µg/g	420	247	345	833	600	452	280	372	28	604	1130	309	650	230	1860	2120	976	n/a
Mercury	µg/g	0.14	0.06	0.094	0.094	-	-	-	-	-	-	-	0.06	0.05	0.03	0.06	0.07	0.02	6.6
Molybdenum	µg/g	5.23	2.93	6.55	1.66	0.6	< 0.5	1.5	1.8	*	2.1	***23.6***	2.31	2.76	1.67	6.94	4.61	2.49	10
Nickel	µg/g	28.4	28.8	29.7	24.1	28.8	28.3	24.1	28.1	15	44	34.1	32.1	36.9	26.3	37.4	43.2	***72.1***	55[c]
Selenium	µg/g	1.54	< 0.5	0.67	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	*	< 0.5	1.3	0.5	0.3	0.4	0.7	0.8	0.1	4[c]
Silver	µg/g	< 0.05	0.09	0.068	0.064	< 0.5	< 0.5	< 0.5	< 0.5	*	< 0.5	< 0.5	0.07	0.09	0.07	0.13	0.15	0.05	20
Strontium	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Thallium	µg/g	< 0.05	0.069	0.057	0.09	< 0.5	< 0.5	< 0.5	< 0.5	*	< 0.5	< 0.5	0.08	0.06	0.06	0.15	0.12	0.08	1
Tin	µg/g	0.61	0.42	0.53	0.48	< 0.5	< 0.5	< 0.5	< 0.5	*	0.6	< 0.5	0.54	0.5	0.46	0.47	1.07	2.02	50
Uranium	µg/g	0.906	1.74	3.24	1.42	< 0.5	< 0.5	1	1.3	*	1.1	5.6	1.01	1.24	1.62	3	2.62	0.65	23
Vanadium	µg/g	51.3	71.9	65.4	61.5	71	62.2	58.9	66.9	13	169	65.3	63	94	63	86	89	73	250[c]
Zinc	µg/g	44.9	57.9	56.4	76.6	42	43	32	39	20	63	95	46	62	42	92	93	54	200

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284.
Associated Maxxam file: B511928, B520014.
All terms defined within the body of SNC-Lavalin's report.
< Denotes concentration less than indicated detection limit or RPD less than indicated value.
- Denotes analysis not conducted.
n/a Denotes no applicable standard.
* RPDs are not normally calculated where one or more concentrations are less than five times MDL.
NOTE: concentrations are only compared to the higher of the two guidelines for each parameter.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

[a] Regional background soil quality estimate (Protocol 4 for Contaminated Sites, Determining Background Soil Quality, MOE, 2010).

TABLE 4 (Cont'd): Summary of Analytical Results for Metals in Soil

Sample Location		TP14-05			TP14-06	TP14-07	TP14-08	TP14-09	TP14-10	TP14-11	TP14-12				TP14-13	TP14-14				TP14-15	Trench	Federal Guidelines
Sample ID		TP14-05-02	TP14-05-03	QA/QC	TP14-06-03	TP14-07-01	TP14-08-02	TP14-09-02	TP14-10-01	TP14-11-01	TP14-12-01	TP14-12-02	TP14-12-03	QA/QC	TP14-13-01	TP14-14-01	TP14-14-02	TP14-14-03	QA/QC	TP14-15-02	TRENCH14-1	CCME CEQG
Sample Date (yyyy mm dd)		2014 01 08	Duplicate	RPD %	2014 01 08	2014 01 08	2014 01 08	2014 01 08	2014 01 08	2014 01 08	2014 01 08	2014 01 08	Duplicate	RPD %	2014 01 08	2014 01 08	2014 01 08	Duplicate	RPD %	2014 01 08	2014 01 10	Residential/ Parkland Land Use
Depth Interval (m)		0.5 - 0.6	0.5 - 0.6		1.1 - 1.4	0.9 - 1.1	1.2 - 1.4	1.2 - 1.4	0.1 - 0.2	0.5 - 0.6	0.6 - 0.8	1.5 - 1.7	1.5 - 1.7		1.2 - 1.4	0.9 - 1.1	1.7 - 1.8	1.7 - 1.8		0.5 - 0.6	1.8 - 1.9	
Parameter	**Units**	**Analytical Results**																				(RL/PL)
Physical Parameters																						
pH	pH	7	7	0	7.3	6.9	7.5	7.7	***8.1***	7.7	7.5	***8.3***	***8.4***	1	***8.3***	6.9	8	8	0	8	6.96	6 - 8
Total Metals																						
Antimony	µg/g	0.23	0.22	*	0.76	0.24	0.16	0.24	0.12	0.21	0.2	0.25	0.23	*	0.15	0.27	0.27	0.27	0	2.03	< 0.5	20
Arsenic	µg/g	6.6	6.4	3	***45.2***	5.6	3.9	4.1	1.2	5.6	2.5	4.9	4.7	4	4.7	4.7	5.2	5.6	7	***26.9***	4.9	12
Barium	µg/g	76	72.7	4	56.1	84.5	67.3	67.2	41	91.3	145	70.6	69.5	2	106	95.1	66.5	82	21	34.1	33.8	500
Beryllium	µg/g	0.43	0.44	2	0.41	0.3	0.26	0.27	0.07	0.52	0.71	0.28	0.27	4	0.29	0.38	0.33	0.38	14	0.37	< 0.5	4
Boron (Hot Water Soluble)	µg/g	0.2	0.2	*	0.1	< 0.1	0.1	0.1	0.1	0.3	0.7	0.2	0.2	*	0.3	0.2	0.2	0.2	*	0.3	< 0.5	n/a
Cadmium	µg/g	0.45	0.43	5	0.87	0.27	0.23	0.21	0.09	0.31	0.25	0.23	0.21	9	0.19	0.23	0.26	0.22	17	0.79	< 0.5[a]	10
Chromium	µg/g	33	47	35	26	26	30	30	9	38	42	29	30	3	35	40	35	39	11	16	59.4	90[a]
Cobalt	µg/g	11.4	11.8	3	16.2	11.6	8.2	12.3	4.3	14.5	12.2	11.1	11.4	3	12.6	15	14.7	17.2	16	16.5	18.9	50
Copper	µg/g	24.3	25.8	6	47	40.4	29	32.7	11.5	56.8	54.4	37.2	35.4	5	17.5	48	47.7	54.8	14	90.4	43.1	150[c]
Lead	µg/g	5	4.9	2	3.6	3.7	3.2	3.7	1.5	5.1	6.9	3.6	3.7	3	3.9	5.2	4.3	4.9	13	4.3	23.1	140
Lithium	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Manganese	µg/g	492	375	27	429	606	248	499	219	562	321	517	462	11	745	408	474	652	32	349	593	n/a
Mercury	µg/g	0.04	0.04	*	0.1	0.03	< 0.01	0.02	< 0.01	0.03	< 0.01	0.02	0.02	*	0.02	0.03	0.02	0.03	*	0.06	-	6.6
Molybdenum	µg/g	0.82	0.81	1	3.58	0.88	0.99	1.27	0.14	8.24	4.67	0.97	0.92	5	2.55	1.01	0.38	0.4	5	3.82	1	10
Nickel	µg/g	29.9	33	10	27.6	24.9	24.9	29.1	6	33.1	44	31.5	30	5	23.6	37.9	37.1	40.3	8	21.1	41.7	55[c]
Selenium	µg/g	0.3	0.3	*	0.8	0.1	0.3	0.2	< 0.1	0.4	0.4	< 0.1	0.1	*	< 0.1	0.1	< 0.1	< 0.1	*	1.2	< 0.5	4[c]
Silver	µg/g	0.08	0.09	*	0.06	< 0.05	0.09	0.08	< 0.05	0.15	0.17	0.07	0.07	*	0.14	0.11	0.1	0.09	*	0.06	< 0.5	20
Strontium	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Thallium	µg/g	0.1	0.09	*	0.15	0.09	0.06	0.06	< 0.05	0.1	0.11	0.06	0.06	*	0.07	0.06	0.07	0.06	*	0.07	< 0.5	1
Tin	µg/g	0.68	0.83	20	0.58	0.51	0.49	0.5	0.31	0.63	0.82	1.5	0.51	99	0.52	0.58	0.57	0.55	4	0.48	1.1	50
Uranium	µg/g	1.75	1.68	4	2.49	1.54	1.75	0.82	0.34	2.19	2.17	0.42	0.41	2	1.14	0.51	0.31	0.35	12	1.7	< 0.5	23
Vanadium	µg/g	76	76	0	85	66	58	61	35	78	69	64	66	3	65	74	73	83	13	80	137	250[c]
Zinc	µg/g	70	70	0	53	42	35	44	26	65	76	47	48	2	36	53	61	71	15	49	61	200

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284.
Associated Maxxam file: B511928, B520014.
All terms defined within the body of SNC-Lavalin's report.
< Denotes concentration less than indicated detection limit or RPD less than indicated value.
- Denotes analysis not conducted.
n/a Denotes no applicable standard.
* RPDs are not normally calculated where one or more concentrations are less than five times MDL.
NOTE: concentrations are only compared to the higher of the two guidelines for each parameter.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

[a] Regional background soil quality estimate (Protocol 4 for Contaminated Sites, Determining Background Soil Quality, MOE, 2010).

TABLE 4 (Cont'd): Summary of Analytical Results for Metals in Soil

Sample Location		TP15-01				TP15-02				TP15-03		TP15-04			TP15-05			SS15-01	SS15-02	SS15-03	SS15-04	SS15-05	Federal Guidelines
Sample ID		TP15-01-02	TP15-01-03	TP15-01-04	QA/QC	TP15-02-02	TP15-02-03	QA/QC	TP15-02-05	TP15-03-01	TP15-03-03	TP15-04-01	TP15-04-02	TP15-04-03	TP15-05-01	TP15-05-02	TP15-05-03	SS15-01	SS15-02	SS15-03	SS15-04	SS15-05	CCME CEQG
Sample Date (yyyy mm dd)		2015 02 11	2015 02 11	Duplicate	RPD %	2015 02 11	Duplicate	RPD %	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	2015 02 11	Residential/
Depth Interval (m)		0.9 - 1.1	2.0 - 2.1	2.0 - 2.1		0.9 - 1.1	0.9 - 1.1		2.9 - 3.0	0.5 - 0.6	2.0 - 2.1	0.5 - 0.6	0.9 - 1.1	2.0 - 2.1	0.5 - 0.6	0.9 - 1.1	2.0 - 2.1	0.1 - 0.3	0.1 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	Parkland
Parameter	**Units**	**Analytical Results**																					Land Use (RL/PL)
Physical Parameters																							
pH	pH	***8.03***	7.89	7.89	*	7.83	7.69	2	7.9	7.28	7.27	7.33	7.46	7.51	7.37	7.48	7.32	7.12	6.9	7.24	7.17	7.6	6 - 8
Total Metals																							
Antimony	µg/g	0.92	0.54	0.61	12	0.26	0.22	*	0.22	0.17	0.22	0.13	0.18	0.26	0.22	0.26	0.3	0.26	0.14	0.44	0.27	0.33	20
Arsenic	µg/g	***20.8***	***28.2***	***29.3***	4	6.11	6.18	1	4.58	5.07	4.54	3.56	4.27	6.02	4.64	4.99	6.47	6	3.79	7.52	6.27	10.7	12
Barium	µg/g	77	68.7	70.2	2	75.9	71.8	6	67.6	83.3	67.1	94.8	92.8	81.6	129	68.3	98.5	112	164	191	78.6	108	500
Beryllium	µg/g	0.41	< 0.4	0.43	*	< 0.4	< 0.4	*	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.49	< 0.4	< 0.4	0.56	0.52	0.47	4
Boron (Hot Water Soluble)	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	n/a
Cadmium	µg/g	0.791	0.765	0.871	13	0.247	0.246	*	0.199	0.155	0.135	0.168	0.248	0.175	0.257	0.197	0.254	0.249	0.25	0.742	0.311	0.549	10
Chromium	µg/g	39.6	31.1	31	< 1	28.4	26.6	7	28.8	28.9	29	24.5	26.9	39.2	33.6	30.4	50.7	28.8	23.6	47.3	29.6	40.5	90[a]
Cobalt	µg/g	22.5	15.5	17.7	13	9.41	9.05	4	10.6	9.64	9.35	7.8	10.7	12.5	10.8	10.7	17.2	9.47	7.99	20.6	11.5	11.4	50
Copper	µg/g	126	79.9	85.1	6	29.6	28.5	4	31.8	26.6	30	14.2	19.6	41.3	31.8	34.3	61.7	26.5	21.8	50.4	23.7	27.6	150[c]
Lead	µg/g	7.93	32.3	46.5	36	22.8	21.2	7	3.74	3.3	3.35	3.36	57.3	4.79	4.06	3.54	5.34	45.4	4.22	24.5	6.22	6.74	140
Lithium	µg/g	22.3	14.4	15.3	*	9.3	9.1	*	10.9	8.9	9.3	8.7	10.5	11.4	11.4	9	18.4	11.5	8.8	17.1	14.3	15.4	n/a
Manganese	µg/g	1540	684	728	6	364	336	8	633	342	401	253	825	494	307	381	643	550	2,060	2,430	356	486	n/a
Mercury	µg/g	0.065	0.099	0.098	*	< 0.05[a]	< 0.05[a]	*	< 0.05[a]	< 0.05[a]	< 0.05[a]	< 0.05[a]	< 0.05[a]	< 0.05[a]	< 0.05[a]	< 0.05[a]	0.062	< 0.05[a]	< 0.05[a]	0	< 0.05[a]	< 0.05[a]	6.6
Molybdenum	µg/g	4.88	3.06	3.99	26	1.71	1.74	2	0.78	1.47	1.1	0.9	2.4	1.53	1.4	1.42	2.66	3.28	0.91	0.94	1.34	2.32	10
Nickel	µg/g	39.5	31.8	36	12	25.3	24.1	5	27	23.7	23.9	19.3	26.6	33.2	25	23.4	41	27.3	19.7	37.8	27.3	32.8	55[c]
Selenium	µg/g	< 0.5	0.63	0.69	*	< 0.5	< 0.5	*	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	4[c]
Silver	µg/g	0.159	0.111	0.117	*	0.07	0.055	*	0.057	< 0.05	0.089	0.072	0.064	< 0.05	0.216	< 0.05	< 0.05	0.113	< 0.05	0.26	0.136	0.12	20
Strontium	µg/g	65.6	50.2	57.1	13	29.7	26.5	11	35.2	30.1	31.9	26.2	24.7	34.3	56.7	95.9	127	91.1	33.1	67.1	22.3	21.6	n/a
Thallium	µg/g	0.111	0.084	0.111	*	< 0.05	< 0.05	*	< 0.05	< 0.05	0.052	< 0.05	< 0.05	0.052	0.066	0.056	0.063	0.055	0.166	0.125	0.122	0.085	1
Tin	µg/g	0.51	0.38	0.43	*	0.37	0.34	*	0.35	0.29	0.27	0.33	0.45	0.33	0.37	0.31	0.47	0.43	0.3	0.57	0.52	0.44	50
Uranium	µg/g	1.85	1.92	2.31	18	1.07	1.02	5	0.433	2.53	1.5	1.11	1.27	2.06	4.64	1.62	1.48	7.53	1.17	0.981	2.43	1.24	23
Vanadium	µg/g	93.4	75.5	84.9	12	62.7	60.9	3	59.8	63.6	57.3	57.7	64.3	73	70.7	65.8	100	67.6	55.9	99.2	71.1	74.1	250[c]
Zinc	µg/g	86	73	78.9	8	49	45.4	8	49.3	35.2	40.8	38.8	44.5	50.2	41.2	39.7	72.8	110	53	180	75.1	85.3	200

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284.
Associated Maxxam file: B511928, B520014.
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NOTE: concentrations are only compared to the higher of the two guidelines for each parameter.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

[a] Regional background soil quality estimate (Protocol 4 for Contaminated Sites, Determining Background Soil Quality, MOE, 2010).

TABLE 4 (Cont'd): Summary of Analytical Results for Metals in Soil

Sample Location		SS15-06	SS15-07	SS15-08	SS15-09	SS15-10	SS15-11	SS15-12	Federal Guidelines
Sample ID		SS15-06	SS15-07	SS15-08	SS15-09	SS15-10	SS15-11	SS15-12-1	CCME CEQG
Sample Date (yyyy mm dd)		2015 03 11	2015 03 11	2015 03 11	2015 03 11	2015 03 11	2015 03 11	2015 03 11	Residential/
Depth Interval (m)		0.2 - 0.4	1.0 - 1.2	1.0 - 1.2	0.2 - 0.4	0.2 - 0.4	0.3 - 0.5	0.3 - 0.5	Parkland
									Land Use
Parameter	**Units**	**Analytical Results**							**(RL/PL)**
Physical Parameters									
pH	pH	6.54	7.34	7.25	6.72	7.25	7	7.25	6 - 8
Total Metals									
Antimony	µg/g	0.55	0.3	1.23	1.06	1.37	0.16	0.18	20
Arsenic	µg/g	***17.5***	6.53	9.12	***21.8***	***22.3***	4.78	4.51	12
Barium	µg/g	111	79.2	83.1	183	47.7	56.6	84.7	500
Beryllium	µg/g	0.46	0.49	0.47	0.61	0.42	0.49	< 0.4	4
Boron (Hot Water Soluble)	µg/g	-	-	-	-	-	-	-	n/a
Cadmium	µg/g	0.443	0.225	0.242	1.2	0.431	0.209	0.197	10
Chromium	µg/g	31.7	50.1	56	27.4	84.5	32.7	29.6	90[a]
Cobalt	µg/g	12.1	17.7	20.8	18.7	23.5	13.5	9.9	50
Copper	µg/g	21.6	54.8	64.7	27.9	53.3	57.7	22.8	150[c]
Lead	µg/g	23.9	5.56	8.77	9.58	15.9	4.27	4.1	140
Lithium	µg/g	14.2	20.4	22.5	30.5	7.3	12.8	12.1	n/a
Manganese	µg/g	760	679	859	3,570	1,460	541	363	n/a
Mercury	µg/g	0.144	< 0.05[a]	0.057	0.075	0.105	< 0.05[a]	< 0.05[a]	6.6
Molybdenum	µg/g	1.73	0.34	0.43	4.79	8.98	0.72	0.96	10
Nickel	µg/g	27.1	39.6	45.1	33.4	***71.4***	28.9	24.5	55[c]
Selenium	µg/g	< 0.5	< 0.5	< 0.5	< 0.5	0.64	< 0.5	< 0.5	4[c]
Silver	µg/g	0.06	0.065	0.085	0.111	0.178	0.125	0.103	20
Strontium	µg/g	30.2	46.1	51.5	43.8	23.3	24.6	28.2	n/a
Thallium	µg/g	0.111	0.066	0.07	0.179	0.126	0.06	0.058	1
Tin	µg/g	0.53	0.44	0.6	0.45	0.54	0.41	0.4	50
Uranium	µg/g	1.72	0.39	0.373	3.69	0.77	1.41	1.14	23
Vanadium	µg/g	79.1	97.2	105	75.4	35.7	75.8	68.1	250[c]
Zinc	µg/g	84.1	74.1	94.8	147	46.4	65.7	60.3	200

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284.
Associated Maxxam file: B511928, B520014.
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[a] Regional background soil quality estimate (Protocol 4 for Contaminated Sites, Determining Background Soil Quality, MOE, 2010).

TABLE 5: Summary of Analytical Results for Salinity in Soil

Sample Location		EXC13-F17	EXC13-F30	EXC13-W13	BH14-01		BH14-02			BH14-06	BH14-07	BH14-08	BH14-09	BH14-10	BH14-11	BH14-12	TP14-22	TP14-23	TP14-24	Federal Guidelines
Sample ID		EXC13-F17-130308	EXC13-F30-130321	EXC13-W13-130308	BH14-01-01	BH14-01-03	BH14-02-02	BH14-02-03	QA/QC	BH14-06-01	BH14-07-01	BH14-08-01	BH14-09-05	BH14-10-07	BH14-11-02	BH14-12-03	TP14-22-01	TP14-23-02	TP14-24-01	CCME CEQG
Sample Date (yyyy mm dd)		2013 03 08	2013 03 21	2013 03 08	2014 01 09	2014 01 09	2014 01 09	Duplicate	RPD %	2014 03 05	2014 03 05	2014 03 05	2014 03 05	2014 03 06	2014 03 06	2014 03 06	2014 03 07	2014 03 07	2014 03 07	Residential/
Depth Interval (m)		0.0 - 0.1	0.0 - 0.1	0.0 - 0.1	0.5 - 0.6	3.5 - 3.7	1.2 - 1.5	1.2 - 1.5		0.2 - 0.3	0.3 - 0.6	0.3 - 0.5	3.2 - 3.4	5.3 - 5.5	1.7 - 1.8	3.2 - 3.5	0.8 - 0.9	1.4 - 1.5	0.2 - 0.3	Parkland
Field Screen (ppm)					65	150	70	70												Land Use
Parameter	**Units**	**Analytical Results**																		(RL/PL)
Soil Salinity																				
Soluble pH	pH	-	-	-	-	-	-	-	-	7.45	7.09	6.81	6.82	7.69	7.33	7.99	7.29	6.83	6.42	n/a
% Saturation	%	45	63.1	68.9	40	40	42	42	0	54	68	48	56	30	40	58	40	48	39	n/a
Soluble Calcium	mg/L	49.6	35.3	58.1	35	67	132	158	18	37	56	76	9	83	26	31	49	23	16	n/a
Soluble Chloride	mg/L	59.2	107	12.9	159	34	834	951	13	-	-	-	-	-	-	-	6	4	5	n/a
Soluble Magnesium	mg/L	< 5	< 5	9.1	2	12	13	12	8	7	10	6	4	9	3	4	3	2	3	n/a
Soluble Potassium	mg/L	< 20	< 20	< 20	< 2	11	7	7	*	< 2	7	< 2	< 2	7	3	5	< 2	< 2	2	n/a
Soluble Sodium	mg/L	43.8	152	6.9	144	35	530	624	16	131	95	32	15	31	39	47	13	9	18	n/a
Soluble Sulphate	mg/L	85	126	< 10	146	94	238	237	< 1	-	-	-	-	-	-	-	24	12	11	n/a
Conductivity	µS/cm	468	782	256	960	610	***3,370***	***3,890***	14	780	760	540	150	660	360	410	310	200	200	2,000
Sodium Adsorption Ratio	None	1.71	***7.04***	0.22	***6.4***	1.03	***11.8***	***12.9***	9	***5.17***	3.07	0.95	1.05	0.86	1.93	2.11	0.49	0.48	1.08	5
Theoretical Gypsum Req.	t/ha	-	-	-	< 0.01	< 0.01	0.99	1.49	40	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	n/a
Saturated Paste Sodium	µg/g	26.7	67.6	8.9	58	14	223	262	16	-	-	-	-	-	-	-	5	4	7	n/a
Saturated Paste Chloride	µg/g	19.7	95.8	4.7	64	14	350	399	13	-	-	-	-	-	-	-	2	< 2	2	n/a
Water Soluble Calcium	µg/g	-	-	-	14	27	55	66	18	-	-	-	-	-	-	-	20	11	6	n/a
Water Soluble Magnesium	µg/g	-	-	-	< 1	5	5	5	0	-	-	-	-	-	-	-	1	1	1	n/a
Water Soluble Potassium	µg/g	-	-	-	< 2	4	3	3	*	-	-	-	-	-	-	-	< 2	< 2	< 2	n/a
Water Soluble Sulphate	µg/g	-	-	-	58	38	100	100	0	-	-	-	-	-	-	-	10	6	4	n/a
Calcium (meq/L)	meq/L	-	-	-	1.75	3.34	6.59	7.88	18	-	-	-	-	-	-	-	2.45	1.15	0.8	n/a
Magnesium (meq/L)	meq/L	-	-	-	0.16	0.99	1.07	0.99	8	-	-	-	-	-	-	-	0.25	0.16	0.25	n/a
Sodium (meq/L)	meq/L	-	-	-	6.26	1.52	23.1	27.1	16	-	-	-	-	-	-	-	0.57	0.39	0.78	n/a
Potassium (meq/L)	meq/L	-	-	-	< 0.05	0.28	0.18	0.18	*	-	-	-	-	-	-	-	< 0.05	< 0.05	0.05	n/a
Chloride (meq/L)	meq/L	-	-	-	4.48	0.96	23.5	26.8	13	-	-	-	-	-	-	-	0.17	0.11	0.14	n/a
Sulphate (meq/L)	meq/L	-	-	-	3.04	1.96	4.96	4.93	< 1	-	-	-	-	-	-	-	0.5	0.25	0.23	n/a

Associated AGAT files: 1486799747, 1486800002, 1486800273, 1486801284, 1486818421, 1486820071.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than or equal to CCME CEQG Residential/Parkland Land Use (RL/PL) guideline.

TABLE 6: Summary of Analytical Results for Leachable Hydrocarbons in Soil

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Modified Leachate Extraction Monocyclic Aromatic Hydrocarbons			
			Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)
TP15-01	TP15-01-03	2015 02 11	< 10	< 10	< 10	< 20
	TP15-01-04	Duplicate	< 10	< 10	< 10	< 20
	QA/QC RPD %		*	*	*	*
TP15-02	TP15-02-02	2015 02 11	< 10	< 10	< 10	< 20
BC Standards						
HWR Leachate Quality (HWLQ)			500	240	2,400	30,000

Associated Maxxam file: B511928.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than HWR Leachate Quality (HWLQ) standard.

TABLE 7: Summary of Analytical Results for Leachable PAHs in Soil

Sample Location		TP15-01			TP15-02	BC Standards
Sample ID		TP15-01-03	TP15-01-04	QA/QC	TP15-02-02	HWR
Sample Date (yyyy mm dd)		2015 02 11	Duplicate	RPD %	2015 02 11	Leachate Quality (HWLQ)
Parameter	**Units**	**Analytical Results**				
Modified Leachate Extraction Polycyclic Aromatic Hydrocarbons						
Naphthalene	µg/L	18	16	12	1.6	n/a
2-Methylnaphthalene	µg/L	23	22	4	2.7	n/a
Acenaphthylene	µg/L	< 0.1	< 0.1	*	< 0.1	n/a
Acenaphthene	µg/L	1.3	1.2	8	0.34	n/a
Fluorene	µg/L	< 1.2	< 1.2	*	< 0.37	n/a
Phenanthrene	µg/L	1.1	1	10	0.39	n/a
Anthracene	µg/L	0.22	0.2	*	0.46	n/a
Acridine	µg/L	< 0.5	< 0.5	*	< 0.5	n/a
Fluoranthene	µg/L	< 0.1	< 0.1	*	< 0.1	n/a
Pyrene	µg/L	0.14	< 0.1	*	< 0.1	n/a
Benzo(a)anthracene	µg/L	< 0.1	< 0.1	*	< 0.1	n/a
Chrysene	µg/L	< 0.1	< 0.1	*	< 0.1	n/a
Benzo(b&j)fluoranthene	µg/L	< 0.1	< 0.1	*	< 0.1	n/a
Benzo(k)fluoranthene	µg/L	< 0.1	< 0.1	-	< 0.1	n/a
Benzo(a)pyrene	µg/L	< 0.1	< 0.1	*	< 0.1	1
Indeno(1,2,3-cd)pyrene	µg/L	< 0.2	< 0.2	*	< 0.2	n/a
Dibenz(a,h)anthracene	µg/L	< 0.2	< 0.2	*	< 0.2	n/a
Benzo(g,h,i)perylene	µg/L	< 0.2	< 0.2	*	< 0.2	n/a
Quinoline	µg/L	2.3	2.3	0	0.64	n/a

Associated Maxxam file: B511928.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

BOLD Concentration greater than HWR Leachate Quality (HWLQ) standard.

TABLE 8: Summary of Analytical Results for Leachable Metals in Soil

Sample Location		TP15-01			TP15-02	BC Standards
Sample ID		TP15-01-03	TP15-01-04	QA/QC	TP15-02-02	HWR
Sample Date (yyyy mm dd)		2015 02 11	Duplicate	RPD %	2015 02 11	Leachate Quality (HWLQ)
Parameter	**Units**	**Analytical Results**				
Physical Parameters						
Initial TCLP pH	pH	8.28	8.35	< 1	7.62	n/a
Final TCLP pH	pH	6.65	6.78	2	5.68	n/a
Toxicity Characteristic Leaching Procedure Metals						
Antimony	µg/L	< 100	< 100	*	< 100	n/a
Arsenic	µg/L	< 100	< 100	*	< 100	2,500
Barium	µg/L	240	220	*	430	100,000
Beryllium	µg/L	< 100	< 100	*	< 100	n/a
Boron	µg/L	< 100	< 100	*	< 100	500,000
Cadmium	µg/L	< 100	< 100	*	< 100	500
Chromium	µg/L	< 100	< 100	*	< 100	5,000
Cobalt	µg/L	< 100	< 100	*	< 100	n/a
Copper	µg/L	< 100	< 100	*	< 100	100,000
Iron	µg/L	2,650	2,990	12	1,550	n/a
Lead	µg/L	< 100	< 100	*	< 100	5,000
Mercury	µg/L	< 2	< 2	*	< 2	100
Molybdenum	µg/L	< 100	< 100	*	< 100	n/a
Nickel	µg/L	< 100	< 100	*	< 100	n/a
Selenium	µg/L	< 100	< 100	*	< 100	1,000
Silver	µg/L	< 100	< 100	*	< 100	5,000
Thallium	µg/L	< 100	< 100	*	< 100	n/a
Uranium	µg/L	< 100	< 100	*	< 100	10,000
Vanadium	µg/L	< 100	< 100	*	< 100	n/a
Zinc	µg/L	350	< 100	*	< 100	500,000
Zirconium	µg/L	< 100	< 100	*	< 100	n/a

Associated Maxxam file: B511928.

All terms defined within the body of SNC-Lavalin's report.

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

BOLD Concentration greater than HWR Leachate Quality (HWLQ) standard.

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Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-01

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	26.176	Borehole Logged By:	AAR
Borehole Dia. (m)	0.15	Top of Casing Elev. (m)	27.071	Date Drilled:	2014 01 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365647.042	Easting: 465884.745	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight

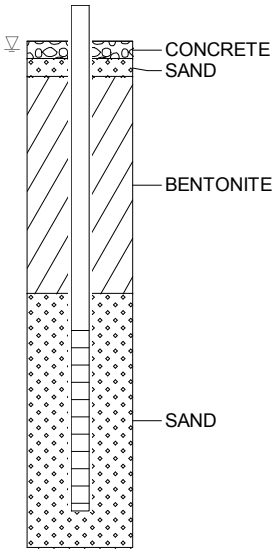
Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-01

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SAND and GRAVEL (FILL), grey, loose, wet.						
	SILT, sandy, some gravel, subangular, brown, mottled grey, stiff, damp to moist.			**1-01**			65
1							
2				1-02			85
3	SILT, sandy, some gravel, subangular, blue/grey, firm, moist to wet.						
	Between 3.7 m and 4.0 m - trace clay, wet.			**1-03**			150
4							
	Bottom of hole at 4.6 m.						
5							
6							
7							
8							
9							
10							



NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-02

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Solid Stem Auger	Ground Surface Elev. (m)	33.660	Borehole Logged By:	AAR
Borehole Dia. (m)	0.20	Top of Casing Elev. (m)	34.575	Date Drilled:	2014 01 09
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365600.462	Easting: 465878.887	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight

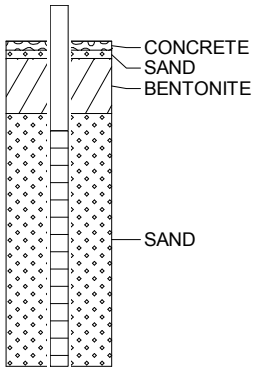
Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-02

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, SAND and GRAVEL (FILL), angular, brown, moist.			2-01			0
1	SILT, SAND and GRAVEL, angular, grey, wet. Below 1.2 m - hydrocarbon-like odour, staining, liquid product. Between 1.5 m and 2.0 m - increased silt, decreased sand and gravel.			**2-02** **2-03***			70
2				**2-04**			105
	BEDROCK (suspect), fractured.						
3	Bottom of hole at 2.9 m.						



NOTES
Bolded sample denotes sample analyzed.
* denotes blind field duplicate.
2-03 is a blind field duplicate of 2-02.
Monitoring well installed with hollow stem auger.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-03

PAGE 1 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow Stem Auger/Odex	Ground Surface Elev. (m)	41.954	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	42.947	Date Drilled:	2014 01 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365580.237	Easting: 465873.974	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight
- Odex

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-03

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SILT, trace sand, trace gravel, rootlets, brown, medium dense, moist.						
	BEDROCK, fractured, some silt in fractures, moist.						
2	BEDROCK.						
10							

CONCRETE
SAND
BENTONITE

NOTES
Top 13.7 m drilled on 2014 01 09.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-03

PAGE 2 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow Stem Auger/Odex	Ground Surface Elev. (m)	41.954	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	42.947	Date Drilled:	2014 01 10
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365580.237	Easting: 465873.974	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight
- Odex

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Depth in Metres | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

Soil Vapor (ppm)
- ○ Reading within indicated scale
- ● Reading outside indicated scale

10^1 10^2 10^3 10^4

Solid PVC
Slotted PVC

Well Name 1: MW14-03

10 BEDROCK. *(continued)*

11

12

13

14 Below 14.0 m - possible fractures.

15

16

17 Bottom of hole at 16.8 m.

18

19

20

BENTONITE

SAND

NOTES
Top 13.7 m drilled on 2014 01 09.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-04

PAGE 1 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow/Solid Stem Auger/Odex	Ground Surface Elev. (m)	41.457	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	42.271	Date Drilled:	2014 01 13
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365579.653	Easting: 465857.455	Log Typed By:	NDS

Drilling Legend: Sample Interval; Auger Flight; Odex

Water/NAPL Levels: Water Level 1; Water Level 2; NAPL; NAPL

Reading within indicated scale; Reading outside indicated scale

Solid PVC; Slotted PVC

Well Name 1: MW14-04

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, some sand, some gravel, subrounded, brown, soft, damp to moist.			4-01		0	
	SAND and GRAVEL, subangular, some silt, medium dense, damp.						
1	SILT, SAND and GRAVEL, medium stiff/dense, moist to wet.			**4-02**		0	
	BEDROCK, fractured, some silt in fractures.						
2							
	BEDROCK.						
3							
4							
5							
6							
7							
8							
9							
10							

CONCRETE

SAND

BENTONITE

NOTES
Bolded sample denotes sample analyzed.
Drilling started on 2014 01 10.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-04

PAGE 2 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow/Solid Stem Auger/Odex	Ground Surface Elev. (m)	41.457	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	42.271	Date Drilled:	2014 01 13
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365579.653	Easting: 465857.455	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight
- Odex

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Depth in Metres | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

Soil Vapor (ppm)
- ○ Reading within indicated scale
- ● Reading outside indicated scale

10^1 10^2 10^3 10^4

Well Name 1: MW14-04
- Solid PVC
- Slotted PVC

10 BEDROCK. *(continued)*

11

12

13

14

15 Bottom of hole at 15.2 m.

16

17

18

19

20

BENTONITE

SAND

NOTES
Bolded sample denotes sample analyzed.
Drilling started on 2014 01 10.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-05

PAGE 1 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow Stem Auger/Odex	Ground Surface Elev. (m)	37.067	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	37.850	Date Drilled:	2014 01 13
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365588.372	Easting: 465890.409	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight
- Odex

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-05

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SILT, SAND and GRAVEL, subrounded, light brown, damp to moist.						
1							
2	BEDROCK, fractured, some silt in fractures, moist.						
3							
4	BEDROCK.						
5							
6							
7							
8							
9							
10							

CONCRETE
SAND
BENTONITE

NOTES

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-05

PAGE 2 OF 2

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 01 22	Project Number:	616601
Drilling Method	Hollow Stem Auger/Odex	Ground Surface Elev. (m)	37.067	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	37.850	Date Drilled:	2014 01 13
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365588.372	Easting: 465890.409	Log Typed By:	NDS

Drilling Legend
- Sample Interval
- Auger Flight
- Odex

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Depth in Metres | Stratigraphy Plot | Sample Interval Core Run | Sample Number | Blow Count | % Recovery

Soil Vapor (ppm)
- ○ Reading within indicated scale
- ● Reading outside indicated scale

10^1 10^2 10^3 10^4

Solid PVC
Slotted PVC

Well Name 1: MW14-05

10 BEDROCK. *(continued)*

11

12 — SAND

13

Bottom of hole at 13.7 m.

14

15

16

17

18

19

20

NOTES

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-06

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	26.190	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	27.460	Date Drilled:	2014 03 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365643.520	Easting: 465875.350	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-06

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	SAND (FILL), top soil, wet.						
	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subrounded, brown with grey mottling, firm, moist.			**06-01**		100	60
1				06-02			70
						140	
2				06-03			110
						150	
3				06-04			80
	Below 3.7 m - grey, moist to wet.						
4	Below 4.0 m - wet.			**06-05**			105
	Bottom of hole at 4.3 m.						
5							
6							
7							
8							
9							
10							

10^1 10^2 10^3 10^4

CONCRETE
BENTONITE
SAND

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-07

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	26.280	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	27.320	Date Drilled:	2014 03 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365652.950	Easting: 465893.620	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-07

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	TOPSOIL (FILL).						
	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subrounded, reddish brown, soft, wet.			**07-01**		75	80
1	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subrounded, brown with grey mottling, moist.			07-02		140	85
2				07-03			90
				07-04		150	110
3	Below 3.2 m - grey, moist to wet.						
	Below 3.7 m - wet.			07-05			60
4	Bottom of hole at 4.3 m.						
5							
6							
7							
8							
9							
10							

Soil Vapour (ppm): 10^1 10^2 10^3 10^4

CONCRETE
BENTONITE
SAND

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-08

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	26.870	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	27.360	Date Drilled:	2014 03 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365619.330	Easting: 465872.830	Log Typed By:	CD

Drilling Legend: Sample Interval; Vibrasonic

Water/NAPL Levels: Water Level 1; Water Level 2; NAPL; NAPL

Reading within indicated scale; Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC; Slotted PVC

Well Name 1: MW14-08

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	TOPSOIL (FILL).					85	0
	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subrounded, brown with grey mottling, soft, wet.			**08-01** **08-02***			
	Below 0.5 m - firm, moist.						
1				08-03		150	40
2				08-04			0
	Below 2.6 m - moist to wet.					140	
				08-05			60
3							
	Below 3.7 m - grey, wet.			08-06			0
4						100	
	SAND and GRAVEL, medium to coarse grained, trace silt, grey, loose, wet.			08-07			160
	BEDROCK, grey.			08-08*			
5	Bottom of hole at 5.0 m.						
6							
7							
8							
9							
10							

CONCRETE

BENTONITE

SAND

NOTES
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Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-09

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	31.930	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	32.730	Date Drilled:	2014 03 05
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365613.830	Easting: 465897.630	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-09

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	GRAVEL and COBBLES (FILL), coarse, angular.						
	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subangular, brown, firm, moist.			09-01		75	25
1	Below 1.2 m - moist to wet. Between 1.4 m and 2.1 m - wet.			**09-02** **09-03***		150	0
2				09-04			70
	Below 2.7 m - moist.					180	
3				**09-05**			220
4				09-06			0
	Bottom of hole at 4.3 m.						
5							
6							
7							
8							
9							
10							

Soil Vapour (ppm): 10^1 10^2 10^3 10^4

CONCRETE
BENTONITE
SAND
BENTONITE

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-10

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	40.940	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	41.740	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365568.100	Easting: 465914.550	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-10

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	SILT and SAND and GRAVEL, fine to coarse grained, subangular, brown, soft, loose, wet, trace rootlets.			10-01		100	55
1	SILT, some sand, some gravel, fine to coarse grained, subangular, brown, soft, wet, trace rootlets.			10-02		100	70
2	BOULDER.			10-03			75
3	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, subangular, brown, soft, wet, trace rootlets. Below 2.7 m - firm, moist.			10-04		100	80
4				10-05			110
5				10-06		100	110
6	SILT, some sand, fine to coarse grained, some gravel, fine to coarse, subangular, grey, firm, wet.			**10-07** **10-08***			230
7	BEDROCK.			**10-09**		100	105
8							
9						100	
10	Bottom of hole at 10.2 m.						
11							
12							

Soil Vapour (ppm): 10^1 10^2 10^3 10^4

CONCRETE
BENTONITE
SAND
BENTONITE

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-11

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	26.700	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	27.670	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365622.560	Easting: 465823.520	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-11

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	ORGANICS and SILT, dark brown, soft, moist, rootlets. WOOD (FILL).					100	
1	SILT, sandy, fine grained, trace gravel, fine, subrounded, light brown with orange and light grey mottling, medium stiff, wet.			11-01			105
2	Below 1.8 m - some clay, very stiff.			**11-02**		100	195
				11-03			180
3	CLAY, silty, trace sand, fine grained, trace gravel, fine, grey-brown, very stiff, moist.					100	
4	Below 3.7 m - trace silt, no gravel, blue-grey, medium stiff, high plasticity.			**11-04**			75
	Bottom of hole at 4.3 m.						
5							
6							
7							
8							
9							
10							

Soil Vapour (ppm): 10^1 10^2 10^3 10^4

CONCRETE
BENTONITE
SAND

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

SNC·LAVALIN

Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Borehole No. : BH14-12

PAGE 1 OF 1

Drilling Contractor	Drillwell Enterprises Ltd.	Date Monitored	2014 03 19	Project Number:	616601
Drilling Method	Vibratory Sonic	Ground Surface Elev. (m)	26.390	Borehole Logged By:	AAR
Borehole Dia. (m)	0.10	Top of Casing Elev. (m)	27.270	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	0.05/0.05	Northing: 5365630.830	Easting: 465835.320	Log Typed By:	CD

Drilling Legend
- Sample Interval
- Vibrasonic

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

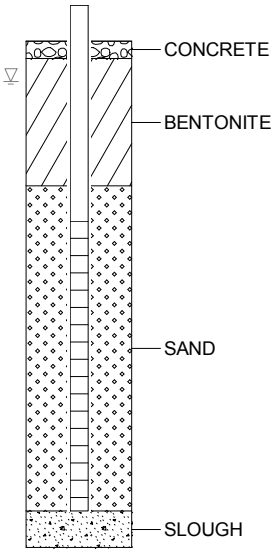
Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name 1: MW14-12

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	SILT and SAND, fine to coarse grained, dark brown, soft, wet, rootlets and organics.					100	
1	SILT, some sand, fine grained, trace gravel, fine to coarse, light brown with orange and light grey mottling, medium stiff, moist to wet.			12-01			55
2	SILT, some clay, trace sand, fine to coarse grained, trace gravel, fine to coarse, light brown with orange and grey mottling, very stiff, moist. Below 1.8 m - clayey.			12-02		100	90
3	CLAY, silty, trace sand, fine to coarse grained, trace gravel, fine to coarse, grey, stiff, moist. Below 3.4 m - medium stiff, moist to wet.			**12-03** **12-04***		100	100
4	Bottom of hole at 4.3 m.						
5							
6							
7							
8							
9							
10							

Soil Vapour (ppm): 10^1 10^2 10^3 10^4



NOTES
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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-01

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Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	35.098	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 07
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365593.882	Easting: 465905.351	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, SAND, GRAVEL and COBBLES (FILL), angular, brown, medium dense, moist.			1-01			0
1				1-02			15
2	SILT, sandy, trace gravel, angular, grey/brown, medium dense, wet.			1-03			5
	SILT, sandy, some gravel, grey/brown, wet, hydrocarbon-like odour, staining [south side of test pit].			**1-04**			50
	SAND, fine grained, silty, light brown, loose, wet [north side of test pit].						
3	Below 2.6 m - wet.			**1-05**			20
	SILT, some sand, some gravel, brown, loose, wet.						
	At 3.2 m - bedrock.						
	Bottom of hole at 3.2 m.						
4							
5							
6							
7							
8							
9							
10							

Soil Vapor (ppm): 10^1 10^2 10^3 10^4

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-02

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	33.312	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 07
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365604.516	Easting: 465885.944	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, some sand, some gravel, angular, trace cobbles, angular, brown, moist.			2-01		0	
1	SILT, sandy, some gravel, dark brown, stiff, moist, hydrocarbon-like odour. Below 1.1 m - wet.			**2-02**		25	
	SILT, sandy, trace gravel, occasional cobbles, light brown, moist.			2-03		0	
2							
3	Bottom of hole at 3.0 m.			2-04		0	
4							
5							
6							
7							
8							
9							
10							

Soil Vapor (ppm): 10^1 10^2 10^3 10^4

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-03

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	35.979	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 07
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365591.809	Easting: 465868.884	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)
10^1 10^2 10^3 10^4

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT and BOULDERS, angular, some sand, some gravel, angular, some cobbles, angular, brown, soft, moist to wet.			3-01			0
1							
2				3-02			0
3	Below 2.8 m - liquid product. Below 2.9 m - wet. Bottom of hole at 3.1 m.			3-03			35
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-04

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a
Drilling Method	Excavator	Ground Surface Elev. (m)	34.959
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365600.397	Easting: 465863.682

Project Number:	616601
Borehole Logged By:	AAR
Date Drilled:	2014 01 07
Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SILT and COBBLES, some sand, some gravel, angular, some rootlets, brown, loose, moist to wet.						
1	SAND, medium to fine grained, silty, some gravel, subangular, light brown, loose, moist.			4-01			0
2	SILT, sandy, fine grained, some gravel, subrounded, light brown, stiff, moist.			**4-02**			0
	Bottom of hole at 2.2 m.						
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-05

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	43.123	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365572.274	Easting: 465851.761	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SILT, SAND and GRAVEL (FILL), fine to coarse grained, clayey, trace rootlets, moist.			5-01			0
	SILT, trace sand, trace gravel, subrounded, trace rootlets, brown, moist, organic odour.			**5-02** **5-03***			0
1	BEDROCK, fractured, trace silt in fractures.						
				5-04			0
2	Bottom of hole at 1.8 m.						
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.
* denotes blind field duplicate.
5-03 is a blind field duplicate of 5-02.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-06

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	41.842	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365580.824	Easting: 465874.573	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)
10^1 10^2 10^3 10^4

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, trace sand, trace gravel, rootlets, brown, medium dense, moist.			6-01 6-02*			0
1	BEDROCK, fractured, some silt in fractures, moist.			**6-03**			0
	Bottom of hole at 1.4 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.
* denotes blind field duplicate.
6-02 is a blind field duplicate of 6-01.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Client
Public Works and Gov't Services Canada

Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-07

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	36.506	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365591.039	Easting: 465891.838	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, SAND and GRAVEL (FILL), subrounded, light brown, damp to moist.						
1				**7-01**			0
	BEDROCK, fractured, some silt in fractures, moist.			7-02			0
2	Bottom of hole at 2.0 m.						
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-08

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Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	28.550	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365615.934	Easting: 465880.502	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, SAND and GRAVEL (FILL).						Reading within indicated scale; Reading outside indicated scale; 10^1 10^2 10^3 10^4
	SILT, sandy, some gravel, subrounded, red/brown, soft to firm, wet.			**8-01**			0
1	Below 0.5 m - light brown.			**8-02**			0
	Bottom of hole at 1.4 m.						
2							
3							
4							
5							
6							
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8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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Location
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Test Pit No. : TP14-09

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	27.224	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365616.665	Easting: 465868.255	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	TOPSOIL (FILL).						
	SILT, sandy, some gravel, subrounded, red/brown, soft to firm, wet.			9-01			0
1	Below 0.3 m - light brown.			**9-02**			0
	Bottom of hole at 1.5 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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Location
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Test Pit No. : TP14-10

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	26.225	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365638.697	Easting: 465877.873	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SAND and GRAVEL, fine to coarse grained, subangular, loose, wet.			**10-01**			0
1	SILT, grey/brown, blocky, moist.			10-02			0
	Bottom of hole at 1.2 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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Location
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Test Pit No. : TP14-11

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	26.976	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365640.934	Easting: 465892.166	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SAND and GRAVEL, fine to coarse grained, grey, loose.						
	SILT, some sand, trace gravel, brown, soft to firm, wet.			**11-01**			0
1	SILT, sandy, fine grained, trace gravel, grey/brown, mottled, soft, wet.			**11-02**			0
	Bottom of hole at 1.5 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-12

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	26.086	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365654.919	Easting: 465886.489	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, some rootlets, dark brown, soft, moist to wet.						
1	SILT, brown, soft to firm, moist to wet.			12-01			0
2	SILT, sandy, some gravel, grey/brown, mottled, soft to firm, wet.			12-02 12-03*			0
	Bottom of hole at 1.7 m.						
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.
* denotes blind field duplicate.
12-03 is a blind field duplicate of 12-02.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-13

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	26.018	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365652.553	Easting: 465878.318	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm)
0	SILT, some rootlets, brown/dark brown, soft, moist to wet.						
1	SILT, sandy, some gravel, grey/brown, mottled, soft to firm, wet.			13-01			0
	Bottom of hole at 1.4 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)
10^1 10^2 10^3 10^4

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.02.14 QA1: AAR Date Approved: 2014.02.14

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-14

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	26.384	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365631.327	Easting: 465880.281	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapor (ppm)
10^1 10^2 10^3 10^4

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery
0	SAND and GRAVEL (FILL), fine to coarse grained, grey.					
1	SILT, trace fine grained sand, blue/grey, soft to firm, moist.			**14-01**		0
	SILT, trace fine grained sand, grey/brown, mottled, hard, blocky, damp.			**14-02** **14-03***		0
2	Bottom of hole at 1.8 m.					
3						
4						
5						
6						
7						
8						
9						
10						

NOTES
Bolded sample denotes sample analyzed.
* denotes blind field duplicate.
14-03 is a blind field duplicate of 14-02.

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-15

PAGE 1 OF 1

Drilling Contractor	Tervita Environmental Services	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	38.937	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 01 08
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365586.363	Easting: 465863.724	Log Typed By:	NDS

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	Blow Count	% Recovery	Soil Vapor (ppm) 10^1 10^2 10^3 10^4
0	SILT and ROOTLETS, trace sand, trace gravel, angular, trace cobbles, angular, brown, soft, moist.			15-01			0
	BEDROCK, fractured, some silt in fractures.			**15-02**			0
	Bottom of hole at 0.6 m.						
1							
2							
3							
4							
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6							
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10							

NOTES
Bolded sample denotes sample analyzed.

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-16

PAGE 1 OF 1

Drilling Contractor	Tervita Drilling and Coring	Date Monitored	n/a
Drilling Method	Excavator	Ground Surface Elev. (m)	35.160
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365600.770	Easting: 465912.620

Project Number:	616601
Borehole Logged By:	AAR
Date Drilled:	2014 03 06
Log Typed By:	CD

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
0	SILT, some sand, fine to coarse grained, some gravel, fine to coarse, subangular, brown, soft, moist, trace roots and composting wood.			16-01			45
				16-02			10
	SAND and GRAVEL, fine to coarse grained, subangular, silty, brown, loose, moist.			**16-03**			60
1	BEDROCK (FRACTURED).						
	Bottom of hole at 1.1 m.						
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-17

PAGE 1 OF 1

Drilling Contractor	Tervita Drilling and Coring	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	35.140	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365600.900	Easting: 465898.050	Log Typed By:	CD

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	SILT, some sand, fine to coarse grained, some gravel, fine to coarse, subangular, brown, soft, moist, trace roots and composting wood.			17-01			65
				17-02			40
1	SAND and GRAVEL, fine to coarse grained, subangular, silty, brown, loose, moist.			**17-03**			105
	BEDROCK (FRACTURED).						
	Bottom of hole at 1.4 m.						

NOTES
Bolded sample denotes sample analyzed.

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Client
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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-18

PAGE 1 OF 1

Drilling Contractor	Tervita Drilling and Coring	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	35.020	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365597.230	Easting: 465888.720	Log Typed By:	CD

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm)
0	SILT, trace sand, fine to coarse grained, trace gravel, fine to coarse, brown, soft, wet, trace rootlets.			18-01			75
				18-02			85
1	SILT, sandy, fine to coarse grained, some gravel, fine to coarse, subrounded, light brown, soft, loose, wet.			**18-03**			95
2				18-04			75
	Below 2.6 m - BEDROCK.						
	Bottom of hole at 2.6 m.						
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

Print Date: 2014.03.25 QA1: AAR Date Approved: 2014.03.25

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Client
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Location
Colwood Former Fuel Oil Depot, North Area, CFB Esquimalt, Colwood, BC

Test Pit No. : TP14-19

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Drilling Contractor	Tervita Drilling and Coring	Date Monitored	n/a	Project Number:	616601
Drilling Method	Excavator	Ground Surface Elev. (m)	39.240	Borehole Logged By:	AAR
Borehole Dia. (m)	n/a	Top of Casing Elev. (m)	n/a	Date Drilled:	2014 03 06
Pipe/Slotted Pipe Dia. (m)	none/none	Northing: 5365588.060	Easting: 465850.700	Log Typed By:	CD

Drilling Legend
Sample Interval

Water/NAPL Levels
Water Level 1
Water Level 2
NAPL
NAPL

Reading within indicated scale
Reading outside indicated scale

Depth in Metres	Soil Description	Stratigraphy Plot	Sample Interval Core Run	Sample Number	EC (µS/cm)	% Recovery	Soil Vapour (ppm) 10^1 10^2 10^3 10^4
0	SILT, some rocks, fractured bedrock, brown, moist, trace rootlets.			**19-01**			80
	BEDROCK (FRACTURED).						
	Bottom of hole at 0.6 m.						
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

NOTES
Bolded sample denotes sample analyzed.

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