



Public Works and Government Services Canada

Requisition No.: EZ897-210334/A

Buy and Sell ID No.: _____

Specifications for

Title: Remediation of Contaminated Soil and Soil Treatment Facility Operation

Location: Wonowon Maintenance Camp and Sikanni Maintenance Camp, Alaska Highway, BC

Project No. R.018385.016/.017 and R.018391.014/.015
Date: June 19, 2020

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Annexes are for reference purposes only.



1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Not Used.

1.4. Work Covered by Contract

1.4.1. Work to be performed under the Contract includes, but is not limited to, the following items, including all ancillary Work, covered further in the Contract:

1.4.1.1. Site access restrictions are as follows:

1.4.1.2. Access to the Wonowon Maintenance Camp is from Highway 97.

1.4.1.3. Access to the Sikanni Maintenance Camp is from Highway 97.

1.4.1.4. Neighbouring or sensitive sites restrictions are as follows: None

1.4.1.5. Classes of Soil based on Environmental Quality Criteria are:

1.4.1.5.1. Hazardous Waste Quality

1.4.1.5.2. Waste Quality

1.4.1.5.3. Non-Contaminated Quality

1.4.1.6. Soil classification based on insitu testing; exsitu testing may be required as directed by the Departmental Representative.

1.4.1.7. Treatment of Contaminated Water Offsite. Contractor responsible for transport and treatment. Contractor takes ownership of all material leaving site.

1.4.1.8. Excavation of Contaminated Soil and surface restoration area as per Drawings. Contractor solely responsible for excavating to Contaminated Material Limits. Excavation Limits on Drawings based on a nominal 1:1 slope for volume estimating purposes only; actual shoring and/or slope requirements responsibility of the Contractor.

1.4.1.9. Transportation of Contaminated Soil to facilities. Contractor takes ownership of all material leaving site

1.4.1.10. Disposal of Contaminated Soil. All material identified as Contaminated on the Site must be disposed of at a Disposal Facility, including material that has been Treated.

1.4.1.11. Operation of a Soil Treatment Facility under the control of PSPC. After bioremediation soil will be stockpiled within the STF for exsitu testing. After testing confirms soil is compliant soil will be stockpiled within 500 m of STF. Non-compliant soil to be returned to STF for further bioremediation.

1.5. Location

1.5.1. The Site locations are shown on Drawings.

1.6. Project/Site Conditions

- 1.6.1. Contractor must provide personnel and equipment with appropriate experience for site conditions, including experience in remediating site-specific Contaminated Material. Contractor to provide specialized material handling, health and safety, and environmental protection procedures, and must have knowledge of appropriate regulations.
- 1.6.2. Work at Site involves Work with Contaminated Material. Complete list of anticipated contaminants and concentration levels on the Site available separately in Annexes and/or Drawings.
- 1.6.3. Existing condition on the Site identified according to Drawings. Annexes provided for reference purposes only.

1.7. Other Contracts

- 1.7.1. Other contracts are currently in progress at Site.
- 1.7.2. Other contracts are:
 - 1.7.2.1. Environmental and other consultants.
 - 1.7.2.2. Site users as identified in Contract Documents.
- 1.7.3. Further contracts may be awarded while the Contract is in progress.
- 1.7.4. Cooperate with other contractors in carrying out their respective works and carry out directions from Departmental Representative.
- 1.7.5. Coordinate Work with that of other contractors. If any part of Work under the Contract depends for its proper execution or result upon Work of another contractor, report promptly to Departmental Representative, in writing, any defects which can interfere with proper execution of this Work.

1.8. Contractor's Use of Site

- 1.8.1. Use of Site:
 - 1.8.1.1. For the sole benefit of Canada.
 - 1.8.1.2. Exclusive and only for completion of the execution of Work.
 - 1.8.1.3. Assume responsibility of Prime Contractor and control for assigned premises for performance of this Work.
 - 1.8.1.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
- 1.8.2. There are no pre-existing arrangements for access or encroachment on neighbouring properties. Offsite access, occupancy, or encroachment is the responsibility of the Contractor.
- 1.8.3. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
- 1.8.4. Do not unreasonably encumber Site with material or equipment.
- 1.8.5. Accommodate common areas with other Site users, including roadways.

- 1.8.6. Segregate Contractor's work area from common areas to prevent unintentional multiple employer worksite, as required.

1.9. Existing Permits

- 1.9.1. Existing Permits and Authorizations are included in the Annexes:
1.9.1.1. None
- 1.9.2. Contractor assumes responsibility for relevant portions of existing permits.
- 1.9.3. Changes to existing permits must be accepted by Departmental Representative. Changes to existing permits responsibility of Contractor, including resubmission to regulators as determined by the Contractor's Qualified Professional. Contractor assumes all responsibility for changed permits.
- 1.9.4. Permits required other than the existing permits responsibility of Contractor.

1.10. Schedule Requirements

- 1.10.1. Work to be initiated: as soon as practical, and no later than 14 days, after Contract notice.
- 1.10.2. Pre-Mobilization Submittals: at least 10 Working Days prior to mobilization to Site, Submit all documents required for mobilization, including at a minimum the Contractor's site-specific project Health and Safety Plan and emergency procedures.
- 1.10.3. Site Works: Final Completion no later than 2020 September 30.
- 1.10.4. Completion of the Work: no later than 2020 December 4. Includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

1.11. Hours of Work

- 1.11.1. Restrictive as follows:
1.11.1.1. Working Days are Monday to Sunday.
1.11.1.2. Working Hours are 07:00 to 19:00.
- 1.11.2. Work outside of Working Days and Working Hours is at Department Representative's sole discretion, and must be accepted in writing by Departmental Representative by Submission.
- 1.11.3. Be responsible for Site outside of Working Days and Working Hours and have a continuous presence on Site as required, in accordance with the Contract, or as directed by the Departmental Representative, to ensure:
1.11.3.1. Protection of health and safety for potentially hazardous activities (eg deep open excavations).
1.11.3.2. Site security for Sites in urban environments.
1.11.3.3. Maintenance of environmental monitoring and protection measures for Sites in urban environments or with sensitive neighbouring properties.

1.12. Security Clearances

- 1.12.1. Not Used.

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

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

- 1.2.1. Advisory: notices, instructions, or directions issued by the Departmental Representative to the Contractor.
- 1.2.2. Certificate of Completion: see General Conditions.
- 1.2.3. Change Order: PWGSC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.
- 1.2.4. Classification: material (including soil and water) categorized into different classes based on Environmental Quality Criteria. Includes Hazardous Waste Quality, Waste Quality, Non-Contaminated Quality. Sub-classification based on specific parameters as identified in Contract. Re-classification must have approval of Departmental Representative.
- 1.1.1. Confirmation Samples: soil and sediment samples collected from the base and walls of the excavation by the Departmental Representative to confirm that the remedial objectives for the Work have been met.
- 1.1.2. Contaminated Material: material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) exceed the levels specified in policies and regulations. Includes Hazardous Waste Quality and Waste Quality. Does not include Non-Contaminated Quality material. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:
- 1.1.2.1. Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guidelines*, the CCME *Canada-wide Standard for Petroleum Hydrocarbons (PHC) in Soil*, and the Federal Contaminated Sites Action Plan (FCSAP) *Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites*.
- 1.1.2.2. *BC Hazardous Waste Regulation*, *BC Contaminated Sites Regulation*, and *BC Approved Water Quality Guidelines*.
- 1.1.2.3. *Yukon Special Waste Regulation*, *Yukon Contaminated Sites Regulation*.
- 1.1.3. Contaminated Soil Extents: lateral and vertical extents of Contaminated Soil to be remediated to meet remediation objectives. Does not include Topsoil, Overburden, or other Non-Contaminated Quality Soil excavated incidentally. Extents, including contaminants and concentrations, on Drawings are approximate and may vary based on field observations or Confirmation Samples.
- 1.1.4. Contaminated Water Treatment Plant: a temporary onsite or existing offsite facility located in Canada that is designed, constructed and operated for the

- handling or processing of Contaminated Water in such a manner as to change the physical, chemical or biological character or composition of the water to lower than the site-specific remedial objective, Discharge Approval, and in compliance with all regulations.
- 1.1.5. Contemplated Change Notice: PWGSC form issued by the Departmental Representative to the Contractor requesting Contractor to provide a quote, which may result in a Change Order.
 - 1.1.6. Contract: see General Conditions.
 - 1.1.7. Contract Amount: see General Conditions.
 - 1.1.8. Contractor: see General Conditions.
 - 1.1.9. Departmental Representative: see General Conditions.
 - 1.1.10. Discharge Approval: permit, certificate, approval, license, or other required form of authorization issued by appropriate federal agency, province, territory, or municipality having jurisdiction and authorizing discharge.
 - 1.1.11. Disposal Facility: an offsite facility specifically used to introduce Contaminated Material into the environment for the purpose of final burial.
 - 1.1.12. 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 humankind; or degrade environment aesthetically, culturally and/or historically.
 - 1.1.13. Environmental Protection: prevention, control, mitigation, and restoration of pollution and habitat or environmental disruption during construction. Control of Environmental Pollution and Damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; vibrations; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
 - 1.1.14. Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including: personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.
 - 1.1.15. Environmental Quality Criteria: numerical material criteria used on Site based on Standards and/or Guidelines specified by the Canadian Council of Ministers of the Environment and/or BC *Contaminated Sites Regulation* or Yukon *Contaminated Sites Regulation*, as applicable, using appropriate Land Use and Site-specific Factors.
 - 1.1.16. Excavation Extents: lateral and vertical extents of Soil to be excavated to meet Contaminated Soil Extents, as determined by Contractor's Qualified Professional. Includes Overburden. Extents on Drawings are approximate and may vary based on field observations or Confirmation Samples.
 - 1.1.17. Extension of Time: see General Conditions.

- 1.1.18. Extension of Time on Contracts: PWGSC form requesting an Extension of Time.
- 1.1.19. Facility Authority:
 - 1.1.19.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.1.19.2. For facilities on First Nation reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.1.19.3. For facilities on First Nations land in Canada subject to the First Nation Land Management Act regime: the relevant First Nation Council. Documentation must be provided that the facility is on land subject to the First Nation Land Management Act regime.
 - 1.1.19.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
- 1.1.20. Final Completion: see General Conditions.
- 1.1.21. Final Excavation Limits: lateral and vertical extents of excavation as determined by Contractor's Qualified Professional Surveyor. Includes Contaminated Soil, Topsoil, Overburden, or other Non-Contaminated Quality Soil excavated incidentally including Temporary Sloping and Shoring.
- 1.1.22. Hazardous Waste Quality: Contaminated material which meets the applicable Regulatory definition of Hazardous Waste.
- 1.1.23. Land Treatment Facility (LTF): equivalent of Soil Treatment Facility.
- 1.1.24. Landfill Facility: an offsite facility specifically used to introduce Non-Contaminated Quality Soil into the environment for the purpose of final burial.
- 1.1.25. Master Plan: baseline schedule determined by Contractor compliant with Schedule Requirements. Duration for any portion of the Work based on Master Plan.
- 1.1.26. Materials Source Separation Program: consists of a series of ongoing activities to separate reusable and recyclable waste into categories from other types of waste at point of generation.
- 1.1.27. National Master Specifications: the Specifications are subdivided in accordance with the current 6 digit National Master Specifications System; the first 2 digits are the Division, the last 4 digits are the Section. A Division may consist of the Work of more than 1 Subcontractor; responsibility for determining which Subcontractor provides the labour, material, equipment and services required to complete the Work rests solely with the Contractor
- 1.1.28. Non-Contaminated Quality: material that does not exceed applicable Environmental Quality Criteria.
- 1.1.29. Onsite Soil Treatment Facility (Onsite STF): a facility constructed and operated on property under the control of PWGSC specifically used to bioremediate Contaminated Soil originating only from federal Sites.
- 1.1.30. Overburden: Non-Contaminated Quality Soil excavated incidentally as required above or adjacent to Contaminated Soil. Includes Topsoil.

- 1.1.31. Oversize Debris: Waste that is required to be excavated and is: larger than 1 cubic metre or larger than 2 metres in one dimension, cannot be removed with a typical excavator with bucket, and requires the use of special equipment (e.g., saws, hydraulic cutters, excavator hammers, vibratory pile extractors). Includes bedrock, boulders, pilings, pipes, building structures, and concrete foundations.
- 1.1.32. Prime Contractor: see General Conditions “Contractor”, BC Occupational Health and Safety Regulations “Prime Contractor”, and Yukon Occupational Health and Safety Act “Constructor”.
- 1.1.33. Progress Payment: see General Conditions.
- 1.1.34. Progress Survey: Survey conducted using equipment such as tape measurements, non-differential GPS, theodolite, or truck counts. Not a survey conducted by a Qualified Professional Surveyor.
- 1.1.35. PWGSC: Public Works and Government Services Canada (also known as PSPC: Public Services and Procurement Canada). Representative of Canada with control of the Site.
- 1.1.36. Qualified Professional: a person who is registered in relevant jurisdiction with his or her appropriate professional college/association, acts under that professional college/association's code of ethics, and is subject to disciplinary action by that professional college/association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Only full membership will be considered to be a Qualified Professional (ie no "in training" designations).
Includes:
 - 1.1.36.1. Association of the Chemical Profession of British Columbia.
 - 1.1.36.2. British Columbia College of Applied Biology.
 - 1.1.36.3. British Columbia Institute of Agrologists.
 - 1.1.36.4. Engineers and Geoscientists British Columbia.
 - 1.1.36.5. Engineers Yukon.
- 1.1.37. Qualified Professional Surveyor: a person who is registered in relevant jurisdiction with his or her appropriate professional college/association, acts under that professional college/association's code of ethics, and is subject to disciplinary action by that professional college/association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Only full membership will be considered to be a Qualified Professional (ie no "in training" designations).
Includes:
 - 1.1.37.1. Association of British Columbia Land Surveyors.
 - 1.1.37.2. Association of Canada Lands Surveyors.
 - 1.1.37.3. Applied Science Technologists & Technicians of British Columbia registered in Site Improvements Surveys.
 - 1.1.37.4. Engineers and Geoscientists British Columbia.
- 1.1.38. Quote: Quotation for Design Change or Additional Work. Contractor’s cost proposal issued to the Departmental Representative as per the relevant

- Contemplated Change Notice. May be either a Lump Sum Arrangement or a Unit Price Arrangement.
- 1.1.39. Remediation by Excavation: complete excavation of Contaminated Soil and incidental Non-Contaminated Quality Soil to the Site boundaries for the purpose of remediating the Site to meet numerical standards. Includes full treatment and disposal. Does not include risk assessment or risk management of material onsite. Does not include encapsulation or solidification in place.
 - 1.1.40. Request For Information: notice or other communication issued by the Contractor to the Departmental Representative.
 - 1.1.41. Sewage: liquid waste which is not suitable for direct discharge to the environment, and which must be either treated offsite or discharged to a sanitary sewer. Includes water from hand basin, shower, personal hygiene facilities, or other liquid waste from sanitary facilities.
 - 1.1.42. Site: work area available to Contractor according to Drawings. Does not include shared or public areas, including common roads.
 - 1.1.43. Soil: unconsolidated mineral or organic material, rock, fill, and sediment deposited on land, and other solid material excavated incidentally. Includes Topsoil and Overburden. Includes cleared and grubbed vegetation, litter, rubbish, debris, cobbles, boulders, excess construction material, lumber, steel, plastic, concrete, and asphalt and other waste material.
 - 1.1.44. Soil Treatment Facility: facility for bioremediating contaminated soil. Includes Treatment Cells, Staging Cells, and ancillary Access Roads.
 - 1.1.45. Special Waste: equivalent of Hazardous Waste.
 - 1.1.46. Subcontractor: see General Conditions.
 - 1.1.47. Submit/Submittals: documents from the Contractor to the Departmental Representative as: required by Contract; stipulated in permit, certificate, approval, license, or any other form of authorization; by convention or industry practice. Submittals are final only after review and accepted in writing by Departmental Representative.
 - 1.1.48. Substantial Performance: see General Conditions.
 - 1.1.49. Superintendent: see General Conditions
 - 1.1.50. Supplier: see General Conditions.
 - 1.1.51. Topsoil: Overburden excavated incidentally above Contaminated Soil Extents that is a surface organic layer to facilitate vegetation growth.
 - 1.1.52. Transfer/Interim Storage Facility: an offsite facility specifically used to transfer or short term storage Contaminated Soil during offsite transport.
 - 1.1.53. Treat: handling or processing of Contaminated Material in such a manner as to change the physical, chemical or biological character or composition of Contaminated Material such that it becomes Non-Contaminated Quality and is suitable for final Discharge or Disposal. Treatment includes filtering, bioremediation, thermal desorption, and incineration. Treatment does not include blending, mixing, or dilution. Material sent to a Treatment Facility must be Treated as follows:

- 1.1.53.1. Water must be Treated to meet requirements of a valid and subsisting Discharge Approval held by the Treatment Facility.
- 1.1.53.2. Soil must be Treated to meet (i) less than Waste Quality and (ii) requirements of the subsequent Disposal Facility.
- 1.1.54. Treatment Facility: an offsite facility specifically used to treat Contaminated Soil or Contaminated Water. Treatment Facility may treat soil, sediment, or water. All material Treated at a Treatment Facility must be considered Contaminated Material until final Discharge or Disposal.
- 1.1.55. Waste Quality: material that exceeds applicable Environmental Quality Criteria but is not Hazardous Waste.
- 1.1.56. Wastewater: Non-Contaminated Quality Water that is not Sewage.
- 1.1.57. Work: see General Conditions.

1.2. Action and Informational Submittals

- 1.2.1. Permits: at least 10 Working Days prior to mobilization to Site, Submit copies of all permits, certificates, approvals, or any other form of authorizations and all reporting required.
- 1.2.2. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work. Include:
 - 1.2.2.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.
 - 1.2.2.2. Description of Work performed.
 - 1.2.2.3. Current Site conditions.
 - 1.2.2.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.
 - 1.2.2.5. Signature of Superintendent.
- 1.2.3. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:
 - 1.2.3.1. Calculation of planned cost versus actual cost and schedule forecasting and cash flow projections on a monthly basis, indicating anticipated value of future Progress Payments, for each Description of Work identified in the Unit Price Table.
 - 1.2.3.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.
- 1.2.4. Coordination Meeting Minutes and Drawings: at least 5 Working Days prior to relevant Work commencing, Submit final meeting minutes and drawings from coordination with Subcontractors.
- 1.2.5. Quality Management Plan: within 10 Working Days after Contract award, Submit a quality management plan. Include:
 - 1.2.5.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.
 - 1.2.5.2. Subcontractors responsible for review, inspection and testing.
 - 1.2.5.3. Schedule of submittals of review, inspection and testing results.

- 1.2.6. Review, Inspection, and Testing Results: within 5 Working Days of receipt, Submit all results of reviews, inspection, and testing performed as part of the Work, including laboratory reports and sampling chains of custody.
- 1.2.7. Weigh Scale Certification: at least 5 Working Days prior to use, Submit a copy of the Measurement Canada, Weigh Scale Certification for any onsite or offsite weigh scale used during excavation, transportation, treatment or disposal.
- 1.2.8. Weigh Scale Slips: within 10 Working Days of measurement, Submit all onsite and offsite weigh scale slips for material.

1.3. Laws and Regulations

- 1.3.1. Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply to federal lands, works or undertakings. Soil, sediment, water or other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.
- 1.3.2. Provincial, territorial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.4. Green Requirements

- 1.4.1. Use only environmentally responsible green materials/products with no Volatile Organic Compounds (VOC) emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality – subject of acceptance of Submittal of Materials Safety Data Sheet (MSDS) Product Data.
- 1.4.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.
- 1.4.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, not including soil or water, thus diverting materials from Landfill Facility.

1.5. Smoking Environment

- 1.5.1. Smoking on the Site is not permitted.

1.6. System of Measurement

- 1.6.1. The metric system of measurement (SI) will be employed on the Contract.

1.7. Documents Required

- 1.7.1. Maintain 1 copy each of the following posted at the job Site:
 - 1.7.1.1. General Conditions.
 - 1.7.1.2. Drawings.
 - 1.7.1.3. Specifications.

- 1.7.1.4. Addenda or other modifications to Contract.
- 1.7.1.5. Change orders.
- 1.7.1.6. Current Work schedule.
- 1.7.1.7. Reviewed and final Shop Drawings Submittals.
- 1.7.1.8. One set of record Shop Drawings and Specifications for “as-built” purposes.
- 1.7.1.9. Field and laboratory test reports.
- 1.7.1.10. Reviewed and accepted Submittals.
- 1.7.1.11. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
- 1.7.1.12. Environmental Protection Plan.
- 1.7.1.13. Final Meeting Minutes, Agendas and associated attachments.
- 1.7.1.14. Permits and other approvals.

1.8. Setting out of Work

- 1.8.1. Assume full responsibility for and execute complete layout of Work to locations, lines and elevations according to Drawings.
- 1.8.2. Provide devices needed to layout and construct Work.
- 1.8.3. Provide such services and devices in accordance with the Contract to facilitate Departmental Representative’s inspection of Work.

1.9. Works Coordination

- 1.9.1. Coordinate Work of Subcontractors.
 - 1.9.1.1. Designate one person to be responsible for review of Contract and Shop Drawings and managing coordination of Work.
- 1.9.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.
 - 1.9.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract, to assist them in planning and carrying out their respective work.
 - 1.9.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.
 - 1.9.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.
 - 1.9.2.4. Publish minutes of each meeting.
 - 1.9.2.5. Submit a copy of coordination drawings and meeting minutes as directed by the Departmental Representative.
- 1.9.3. Submit Shop Drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.
- 1.9.4. Work coordination:
 - 1.9.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.
 - 1.9.4.2. Ensure that each trade provides all other trades reasonable opportunity for Final Completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed Work.

- 1.9.4.3. Ensure disputes between Subcontractors are resolved.
- 1.9.5. Failure to coordinate Work is responsibility of Contractor.

1.10. Record Keeping

- 1.10.1. Advisory: Contractual correspondence from the Departmental Representative to the Contractor. Does not include Change Documents. To be sequentially numbered. Include cross references to applicable Request For Information. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any Advisory.
- 1.10.2. Request For Information: Contractual correspondence from Contractor to the Departmental Representative. Includes Submittals. Does not include Change Documents. Must be sequentially numbered. Include cross references to applicable Advisory. Status of the Contractor, including the function of Prime Contractor, must not change by reason of any Request For Information.
- 1.10.3. Maintain adequate records to support information provided to Departmental Representative.
- 1.10.4. Maintain asbestos waste shipment records or other Hazardous Waste Manifests for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.
- 1.10.5. Maintain bills of lading for minimum of 300 Working Days from date of shipment or longer period required by applicable law or regulation.

1.11. Change Documents

- 1.11.1. Change Documents do not relieve Contractor of any obligation.
- 1.11.2. Change Documents do not change the Contractor's responsibility for methods, means and sequences.
- 1.11.3. Change Documents do not change by any reason the status of the Contractor, including the function of Prime Contractor or as supervisor.
- 1.11.4. Change Documents include:
 - 1.11.4.1. Change Order: There may be a change to the Contract Amount by reason of any Change Order. No Extension of Time for completion of the Work by reason of any Change Order.
 - 1.11.4.2. Contemplated Change Notice: No increase to the Contract Amount by reason of any Contemplated Change Notice. No Extension of Time for completion of the Work by reason of any Contemplated Change Notice.
 - 1.11.4.3. Extension of Time on Contracts: There may be a change to the completion of the Work by reason of an Extension of Time on Contracts. No increase to the Contract Amount by reason of any Extension of Time on Contracts.
 - 1.11.4.4. Quote: No increase to the Contract Amount by reason of any Quote. No Extension of Time for completion of the Work by reason of any Quote.

1.12. Inspection

- 1.12.1. Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Site, allow access to such Work whenever it is in progress. Work at locations other than Site includes offsite Facilities.
- 1.12.2. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative or applicable law.
- 1.12.3. If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- 1.12.4. Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

2. PART 2 - PRODUCTS

2.1. Asbestos Containing Materials Prohibition

- 2.1.1. Any material containing any degree of asbestos is banned from use in any and all sites, designs and projects.

3. PART 3 - EXECUTION

3.1. Not Used

- 3.1.1. Not Used.

END OF SECTION

MOBILIZATION AND DEMOBILIZATION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Pre-Mobilization Submittals will be paid in accordance with lump sum price established for all Preconstruction Meetings, final design, planning, health and safety, and other Submittals in accordance with the Contract or required and accepted by the Departmental Representative as in accordance with the Contract prior to mobilization to Site. Also includes Preconstruction Condition Survey and Preconstruction As-Built Documents.
- 1.1.2. Mobilization will be paid in accordance with lump sum price established for mobilizing all necessary equipment, materials, supplies, facilities, and personnel associated with the Works to the Site.
- 1.1.3. Site Preparation will be paid in accordance with lump sum price established to prepare the Site for planned construction works. Includes as required: clearing and grubbing, invasive plant species removal and disposal from work areas, water diversion and associated infrastructure and equipment, demolition, temporary removal of existing infrastructure, utility location, rerouting, and protection, and construction of temporary onsite access roads. Also includes removal of any incidental or generated material.
- 1.1.4. Standby Time will be paid in accordance with unit rate price established for time when construction Work is unable to proceed and that is directly attributable to any neglect or delay that occurs after the date of the Contract on the part of the Departmental Representative in providing any information or in doing any act that the Contract expressly requires the Departmental Representative. Measurement as recorded time by Departmental Representative. Includes machinery and labour standby costs. Does not include items covered by Site Facilities Operation. Standby Time may be pro-rated based on hours of work. Make all efforts to minimize impacts due to delays caused by the Departmental Representative, including re-sequencing Work. Provide documentation of a sufficient description of the facts and circumstances of the occurrence to enable the Departmental Representative to determine whether or not the Standby Time is justified. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work for reviews, sampling, or other work conducted by the Departmental Representative that have time allowances in accordance with the Contract.
- 1.1.5. Site Restoration will be paid in accordance with the lump sum price established to restore the Site to make suitable for post-Work use according to Drawings. Includes re-establishment of pre-existing infrastructure, final grading, including final grading of surface restoration area, topsoil reuse or provide and placement, revegetation, and deconstructing and removal from Site all temporary facilities and removal of any incidental or generated material.

MOBILIZATION AND DEMOBILIZATION

- 1.1.6. Demobilization will be paid in accordance with lump sum price established for demobilizing all equipment and personnel associated with the Works from the Site. Includes decontaminating all equipment prior to removal from Site.
- 1.1.7. Closeout Submittals will be paid in accordance with lump sum price established for Final Site Inspection (for Certificate of Completion purposes), Closeout Meetings, Postconstruction Condition Survey and final As-Built Documents as directed by the Departmental Representative.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Preconstruction As-Built Documents: at least 5 Working Days prior to commencing any disturbance, Submit drawings identifying all infrastructure, including utilities, on the Site. Update drawings as directed by the Departmental Representative.
- 1.3.2. Preconstruction Condition Survey: at least 5 Working Days prior to commencing any disturbance, Submit a report by Contractor's Qualified Professional Surveyor documenting property lines, original site grades (surface elevations) and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other infrastructure both onsite and adjacent sites that may be potentially impacted by the Work.
- 1.3.3. Breakdown of Lump Sum Prices: at least 5 Working Days prior to submitting the first Progress Payment, Submit a breakdown of the Contract lump sum prices including labour, material and time, in detail as directed by the Departmental Representative and aggregating Contract Amount.
- 1.3.4. As-Built Documents: within 10 days of completing site Work, provide Drawings showing all Work, including infrastructure, utilities, excavation limits, backfill material limits and compaction, final grades, and any other improvements or reinstatements.
- 1.3.5. Postconstruction Condition Survey: within 10 days of completing site Work, Submit a report by Contractor's Qualified Professional Surveyor documenting property lines, original site grades (surface elevations) and condition of buildings, utilities, roadways, pathways, landscaping, significant vegetation, and other infrastructure both onsite and adjacent sites that may be potentially impacted by the Work.
- 1.3.6. Closeout Documents: within 20 Working Days of Final Completion of Site Restoration, Submit Completion Documents.

1.4. Mobilization and Demobilization

- 1.4.1. Move all personnel, equipment, supplies, and incidentals to and from the Site.

MOBILIZATION AND DEMOBILIZATION

1.5. Site Preparation

1.5.1. Protection of features:

- 1.5.1.1. Protect existing features with temporary barriers and enclosures as required by applicable local regulations.
- 1.5.1.2. Protect natural and man-made features required to remain undisturbed. Protect existing trees from damage unless otherwise required or located in an area to be occupied by new construction.
- 1.5.1.3. Protect buried utilities that are required to remain undisturbed or in continuous operation during the Work, as identified on Drawings.
- 1.5.1.4. Protect features from surface water damage by temporary structures to divert flow as appropriate.

1.5.2. Protection of Monitoring Wells

- 1.5.2.1. Protect all monitoring wells unless specifically confirmed by Departmental Representative.
- 1.5.2.2. Protect all monitoring wells outside area of surface disturbance, including Contaminated Soil Extents.
- 1.5.2.3. Protect monitoring wells within area of surface disturbance, including Contaminated Soil Extents, as identified in Contract Documents.
- 1.5.2.4. Replace protected monitoring damaged by Work using methods, means, and sequences as directed by the Departmental Representative at Contractor's expense.
- 1.5.2.5. Decommission monitoring wells within area of surface disturbance, including Contaminated Soil Extents, or as otherwise agreed to by Departmental Representative. Decommission in accordance with methods in BC *Groundwater Protection Regulation* or the Yukon Environment *Protocol 7: Groundwater Monitoring Well Installation, Sampling and Decommissioning*, as appropriate.

1.5.3. Security and Safety:

- 1.5.3.1. Provide safety measures to ensure worker and public safety.
- 1.5.3.2. Ensure Site is secure during onsite Work, provide, install, and remove fencing, temporary hoarding, and other security measures as appropriate. Provide onsite personnel security 24 hours/ day 7 days/week as appropriate or in accordance with Contract.
- 1.5.3.3. Site including all construction areas should be secured with locked fencing, temporary hoarding and security personnel as required.

1.6. Existing Conditions and Services

- 1.6.1. Preconstruction Condition Survey to be completed by Contractor's Qualified Professional Surveyor.
- 1.6.2. Size, depth and location of existing utilities and structures as provided in Contract documents are for guidance only. Completeness and accuracy are not guaranteed.

MOBILIZATION AND DEMOBILIZATION

- 1.6.3. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative. All utilities entering Site must be confirmed prior to subsurface disturbance (ie do not rely on as-built documents). As appropriate, confirm locations of buried utilities by independent utility locator and using hand test excavations or hydrovac methods.
- 1.6.4. Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
- 1.6.5. Maintain and protect from damage all utilities and structures encountered, unless Work involves temporarily breaking, rerouting, or connecting existing utilities.
- 1.6.6. Where Work requires temporarily breaking, rerouting, or connecting into existing utilities, obtain permission from both users and utility companies of intended interruption of services, and carry out Work at times determined by the authorities having jurisdiction.
- 1.6.7. Submit schedule to and obtain approval for any shutdown or closure of active service. Adhere to schedule accepted by Departmental Representative and provide notice to affected parties.
- 1.6.8. Provide temporary services as required to maintain critical systems.
- 1.6.9. Where unknown utilities are encountered, immediately verbally notify Departmental Representative and confirm findings in writing.

1.7. As-Built Documents

- 1.7.1. The Departmental Representative will provide paper copies of the Construction Documents as per the Special Instructions to Bidders. Electronic copies of data and drawings in their native format are available on request.
- 1.7.2. Postconstruction Condition Survey to be completed by Contractor's Qualified Professional Surveyor.
- 1.7.3. As Work progresses, maintain accurate records to show all deviations from the Contract. Note changes as they occur on as-built Specifications, Drawings and Shop Drawings.
- 1.7.4. Drawings and Shop Drawings: legibly mark each item to record actual construction, including:
 - 1.7.4.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - 1.7.4.2. Field changes of dimension and detail.
 - 1.7.4.3. Changes made by change orders.
 - 1.7.4.4. Details not on original Drawings.
 - 1.7.4.5. References to related Shop Drawings and modifications.
- 1.7.5. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:
 - 1.7.5.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - 1.7.5.2. Changes made by addenda and change orders.
- 1.7.6. As-built information:

MOBILIZATION AND DEMOBILIZATION

- 1.7.6.1. Record changes in red ink.
- 1.7.6.2. Mark on 1 set of Drawings, Specifications and Shop Drawings at Final Completion of project and, before final inspection, neatly transfer notations to second set.
- 1.7.6.3. Submit 1 set in editable AutoCAD file format with all as-built information.
- 1.7.6.4. Submit all sets as directed by the Departmental Representative.
- 1.7.7. As required, surveying to be completed by Contractor's Qualified Professional Surveyor for as-built documents.

1.8. Pre-existing Stockpile or Onsite Soil Treatment Facility Preparation

- 1.8.1. As required, prior to working soil in pre-existing stockpile or Onsite Soil Treatment Facility:
 - 1.8.1.1. Remove vegetation that could potentially damage liner, including roots.
 - 1.8.1.2. Inspect berms. Grade or place material to maintain height and integrity of berms.
 - 1.8.1.3. Inspect granular base protective layer of liner. Grade base layer to allow uniform slope to sump. Notify Departmental Representative if less than 0.5m thick at any location.
 - 1.8.1.4. Inspect visually liner for damage, including both the base and the berms. Excavate protective base layer in suspect areas (eg depressions that may be due to piping through a liner hole or areas where previous excavations may have led to a liner tear) to inspect liner for damage. Notify Departmental Representative of any significant damage.
 - 1.8.1.5. Make good repairs of any pre-existing damage to liner, both berms and base. Be prepared to repair a minimum of 10 square meters of liner or as shown on Drawings.
 - 1.8.1.6. Pump any collected or sump water from pre-existing stockpile or Onsite Soil Treatment Facility. Treat or otherwise discharge water as required according to Contract or as directed by Departmental Representative.
 - 1.8.1.7. Grade surface of soil to allow stockpiling or bioremediation activities.

1.9. Onsite Access Roads

- 1.9.1. Maintain onsite access roads as follows:
 - 1.9.1.1. Obtain permission to use existing onsite access roads or to construct temporary roads.
 - 1.9.1.2. Maintain and clean roads for duration of Work, keep dry and free of mud.
 - 1.9.1.3. Repair damage incurred from use of roads.
 - 1.9.1.4. Provide photographic documentation of roads used by construction vehicles before, during and after Work.
 - 1.9.1.5. Clean onsite access roads as directed by the Departmental Representative.

MOBILIZATION AND DEMOBILIZATION

1.10. Site Restoration

- 1.10.1. Final site grades must be within 5 cm of pre-existing grades before Work commenced, unless otherwise specified.
- 1.10.2. Re-establish pre-existing drainage, unless otherwise specified. Drainage to be away from existing infrastructure (i.e. Winter Abrasive Storage Shed, Garage Building and Apron and Trailers).
- 1.10.3. Re-establish surface grade of surface restoration area according to Drawings.
- 1.10.4. Re-establish topsoil reusing existing stripped topsoil. If insufficient existing topsoil, import additional topsoil as required. Imported topsoil must, at a minimum, contain: between 50% and 70% sand, less than 25% silt and clay, and between 4% and 15% organic matter (dry weight basis) unless otherwise identified according to Drawings.
- 1.10.5. Clean permanent access roads of contamination resulting from project activity as required or as directed by Departmental Representative, with no increases to Contract Amount or Extension of Time for completion of the Work.
- 1.10.6. Upon Final Completion of Work, remove Non-Contaminated Quality Soil and Debris, trim slopes, and correct defects as directed by the Departmental Representative.
- 1.10.7. Protect newly graded areas from traffic and erosion and maintain free of trash or debris until demobilization is completed and accepted by the Departmental Representative.
- 1.10.8. Reinstate pre-existing utilities and other infrastructure to original location and condition, meeting current standards, codes, and other requirements, unless otherwise identified according to Drawings or as directed by the Departmental Representative.
- 1.10.9. Reinstate surface to pre-existing conditions, including surface material (eg vegetation, gravel, pavement), unless otherwise identified according to Drawings or as directed by the Departmental Representative.
- 1.10.10. Seeding, to be consistent with *Canadian Landscape Standards* for lawns or current version of BC Ministry of Transportation and Infrastructure *Standard Specifications for Highway Construction* unless otherwise identified according to Drawings.

1.11. Completion Documents

- 1.11.1. Submit as directed by the Departmental Representative, a written certificate that the following have been performed:
 - 1.11.1.1. Work has been completed, and inspected and accepted by the Departmental Representative, in accordance with the Contract.
 - 1.11.1.2. Treatment and Disposal of treatable soils have been completed and Disposal of all other soils has been completed.
 - 1.11.1.3. Damage has been repaired, deficiencies have been completed, missing items have been provided, and non-conformance has been corrected, in the opinion of the Departmental Representative.

MOBILIZATION AND DEMOBILIZATION

- 1.11.1.4. Contractor's Qualified Professional report documenting backfilling has met all requirements of the Contract.
- 1.11.2. Defective products will be rejected, regardless of previous inspections. Replace defective products.
- 1.11.3. Prepare all documentation required as part of any permits or other authorizations obtained or otherwise the responsibility of the Contractor.

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

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Preconstruction Meeting Minutes: within 2 Working Days of the Preconstruction Meeting, Submit meeting minutes.

1.3.2. Progress Meeting Minutes: within 2 Working Days of a Progress Meeting, Submit meeting minutes. Submit revised minutes within 2 Working Days of receiving comments by Departmental Representative.

1.3.3. Information for Progress Meetings: at least 2 Working Days prior to scheduled Progress Meetings, Submit all information in accordance with the Contract for Progress Meetings. Include:

1.3.3.1. Agenda for the proposed Progress Meeting.

1.3.3.2. Updated Project Schedule.

1.3.3.3. Copies of transport manifests and disposal receipts for all materials removed from Site.

1.3.3.4. Other information as directed by the Departmental Representative or relevant to agenda for upcoming progress meeting.

1.3.4. Final Site Inspection: within 2 Working Days of the Final Site Inspection, Submit meeting minutes.

1.3.5. Closeout Meetings: within 2 Working Days of the Closeout Meeting, Submit meeting minutes.

1.4. Administrative

1.4.1. Schedule and administer project meetings throughout the progress of the Work weekly and at the call of the Departmental Representative.

1.4.2. Prepare agenda for meetings.

1.4.3. Submit written notice with agenda of each meeting 2 Working Days in advance of meeting date as directed by the Departmental Representative.

1.4.4. Provide physical space and make arrangements for meetings, or arrange for teleconference meetings, as directed by Departmental Representative.

1.4.5. Preside at meetings.

1.4.6. Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

1.4.7. Maintain records of meeting minutes for a minimum of 2 years after Work is completed.

- 1.4.8. Representative of Contractor, Subcontractor(s) and Supplier(s) attending meetings must be qualified and authorized to act on behalf of party each represents.

1.5. Preconstruction (Kickoff) Meeting

- 1.5.1. Within 5 Working Days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
- 1.5.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
- 1.5.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.5.4. Agenda to include:
 - 1.5.4.1. Appointment of official representative of participants in the Work, including Contractor's Superintendent and Departmental Representative.
 - 1.5.4.2. Schedule of Work including Master Plan.
 - 1.5.4.3. Schedule of Submittals including premobilization Submittals including Insurance, Contract Security, Health and Safety Plan, and Environmental Protection Plan.
 - 1.5.4.4. Requirements for temporary facilities.
 - 1.5.4.5. Site security, Health and Safety, Environmental Protection, coordination with other Site users including consultants and other contractors.
 - 1.5.4.6. Change orders, procedures, approvals required, administrative requirements.
 - 1.5.4.7. Monthly Progress Payments, administrative procedures, hold backs.
 - 1.5.4.8. Appointment of inspection and testing agencies or firms.
 - 1.5.4.9. List of Subcontractor(s).

1.6. Progress Meetings

- 1.6.1. During course of Work schedule progress meetings weekly subject to approval by Departmental Representative.
- 1.6.2. Contractor, Superintendent, major Subcontractor(s) involved in Work, and Departmental Representative are to be in attendance.
- 1.6.3. Agenda to include:
 - 1.6.3.1. Review and acceptance of minutes of previous meeting.
 - 1.6.3.2. Review health and safety, including incidents, near misses, and corrective measures.
 - 1.6.3.3. Review Environmental Protection, including incidents, near misses, and corrective measures.
 - 1.6.3.4. Review contractual compliance.
 - 1.6.3.5. Review regulatory compliance.
 - 1.6.3.6. Review communications, problems or concerns with community.
 - 1.6.3.7. Review of Work progress since previous meeting.
 - 1.6.3.8. Field observations, problems, conflicts.

- 1.6.3.9. Updated progress schedule detailing activities planned over next 2 week period. Include review of progress with respect to previously established dates for starting and stopping various stages of Work.
- 1.6.3.10. Problems which impede construction schedule.
- 1.6.3.11. Corrective measures and procedures to regain projected schedule.
- 1.6.3.12. Revision to construction schedule.
- 1.6.3.13. Progress schedule, during succeeding Work period.
- 1.6.3.14. Review submittal schedules: expedite as required.
- 1.6.3.15. Maintenance of quality standards.
- 1.6.3.16. Quantities of material transported, treated, and disposed.
- 1.6.3.17. Review proposed changes for effect on construction schedule and on Final Completion date.
- 1.6.3.18. Other business.
- 1.6.4. Submit draft Progress Meeting Minutes for review and comment by Departmental Representative. Incorporate comments into final Progress Meeting Minutes.

1.7. Toolbox Meetings

- 1.7.1. During the course of the Work, schedule daily toolbox (tailgate) meetings at the start of each Work shift. Multiple meetings are required if the Contractor works multiple shifts within a 24-hour period.
- 1.7.2. All on Site workers to attend, including Contractor, Superintendent, major Subcontractor(s), and environmental consultants. Departmental Representative may attend.
- 1.7.3. Agenda to include:
 - 1.7.3.1. Planned Work activities and environmental considerations for that shift, including hazards, mitigation measures, and emergency procedures.
 - 1.7.3.2. Review previous relevant incident or near-miss reports, both from Site and other Sites.
 - 1.7.3.3. Coordination activities, and roles and responsibilities, required between Contractor, Subcontractor(s), Departmental Representative, other contractor(s) including environmental consultant, site users, and protection of general public and offsite resources.
 - 1.7.3.4. Health and Safety items, including PPE requirements.
 - 1.7.3.5. Environmental Protection items, including emergency equipment.

1.8. Final Site Inspection

- 1.8.1. Within 5 Working Days of completion of Site Works but prior to Demobilization, request a meeting on Site to review the Site.
- 1.8.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.

- 1.8.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.8.4. Agenda to include:
 - 1.8.4.1. Inspect removal of all temporary equipment, materials, supplies, and facilities.
 - 1.8.4.2. Inspect final surface grades.
 - 1.8.4.3. Inspect final vegetation.
 - 1.8.4.4. Inspect permanent facilities for performance and damage.
 - 1.8.4.5. Document all damage, deficiencies, missing items, and non-conformance.
- 1.8.5. If required, and in the opinion of the Departmental Representative, perform another Final Site Inspection after resolving all documented damage, deficiencies, missing items, and non-conformance.

1.9. Closeout Meeting

- 1.9.1. Within 10 Working Days of completion of the Work, request a meeting to review the project.
- 1.9.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
- 1.9.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
- 1.9.4. Agenda to include:
 - 1.9.4.1. Review Certificate of Completion.
 - 1.9.4.2. Review final payment.
 - 1.9.4.3. Identify lessons learned.
 - 1.9.4.4. Perform Contractor Performance Evaluation Report Form.

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

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Master Plan: within 10 Working Days after Contract award, Submit a Master Plan.
- 1.3.2. Schedule of Interruption of Services: at least 5 Working Days prior to any shutdown or closure of active utilities or facilities Submit a schedule identifying type of service and dates of shutdown or closure.
- 1.3.3. Project Schedule and Updates: with Progress Payment, Submit a Project Schedule updated as appropriate. Progress Payment submission is incomplete without an updated Project Schedule acceptable to Departmental Representative.

1.4. Requirements

- 1.4.1. Ensure Master Plan and detail Project Schedules are practical and are compliant with Schedule Requirements.
- 1.4.2. Plan to complete Work in accordance with prescribed milestones and time frame.
- 1.4.3. Limit activity durations to maximum of approximately 10 Working Days, to allow for progress reporting.
- 1.4.4. Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- 1.4.5. Include Work sequencing description and schedule:
 - 1.4.5.1. Work Sequencing description must describe methods, means, and sequences to perform each major task.
 - 1.4.5.2. Work Sequencing schedule must show on a Gantt chart, start, end and dependencies of each major task and also indicates Work to be performed in sequence and in parallel.
 - 1.4.5.3. Major tasks includes all items identified on Unit Price Table.

1.5. Master Plan

- 1.5.1. Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- 1.5.2. Departmental Representative will review and return revised schedules within 5 Working Days.
- 1.5.3. Revise impractical schedule and resubmit within 5 Working Days.

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

1.6. Project Schedule

- 1.6.1. Develop detailed Project Schedule as updates to Master Plan.
- 1.6.2. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- 1.6.2.1. Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table.
- 1.6.2.2. Dates of Submittals including Shop Drawings, product data, MSDS sheets and samples.
- 1.6.2.3. Dates of inspection and testing.
- 1.6.2.4. Final Completion date within the time period in accordance with the Contract, including Amendments.

1.7. Project Schedule Reporting

- 1.7.1. Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.
- 1.7.2. 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.

1.8. Project Meetings

- 1.8.1. Discuss Project Schedule at regular site meetings, 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 accepted dates shown on baseline schedule.
- 1.8.2. Weather related delays with their remedial measures will be discussed and negotiated

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



1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Shop Drawings: at least 5 Working Days prior to commencing applicable Work, Submit Shop Drawings signed by a Contractor's Qualified Professional.

1.4. General

- 1.4.1. Submission details to be commensurate for type of Work and Site conditions. Details depend on Work performed and Contractor's methods, means, and sequences.
- 1.4.2. Contractor's responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative's review of Submittals.
- 1.4.3. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.
- 1.4.4. Contractor's responsibility for deviations in Submittals from requirements of Contract is not relieved by the Departmental Representative's review of Submittals unless Departmental Representative gives written acceptance of specific deviations.
- 1.4.5. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit.
- 1.4.6. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those directed by the Departmental Representative.
- 1.4.7. Do not proceed with Work until relevant Submittals are finalized and have been accepted.
- 1.4.8. 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 responsibility of Contractor.
- 1.4.9. Review Submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each Submittal has been checked and coordinated with requirements of Work and Contract. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- 1.4.10. Verify field measurements and affected adjacent Work are coordinated.
- 1.4.11. Adjustments made on Submittals by the Departmental Representative will not result in an increase the Contract Amount nor an Extension of Time for completion of the Work.

1.4.12. Keep one final copy of each Submittal onsite.

1.5. Submission Requirements

1.5.1. Coordinate each Submittal with the requirements of the Work and the Contract. Individual Submittals will not be reviewed until:

1.5.1.1. Submittals are complete.

1.5.1.2. All related information is available.

1.5.2. Allow 10 Working Days for Departmental Representative's review of each Submittal, unless otherwise specified. No Standby Time charges or increases to Contract Amount or Extension of Time for Departmental Representative's review.

1.5.3. All Submittals are to be sent to Departmental Representative in duplicate as a hardcopy and in electronic format compatible with Departmental Representative's software.

1.5.4. Submittals must include:

1.5.4.1. Date and revision dates.

1.5.4.2. Project title and number.

1.5.4.3. Name and address of:

1.5.4.3.1. Subcontractor.

1.5.4.3.2. Supplier.

1.5.4.3.3. Manufacturer.

1.5.4.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.

1.5.4.5. Contractor's Qualified Professional to sign and seal Submittals in accordance with the Contract or as required by the nature of the Submittal. Submittals to include at a minimum 1 hard copy of original ink sealed document.

1.5.4.6. Details of appropriate portions of Work as applicable.

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

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Contaminated Soil and Water Management Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Soil and Contaminated Water Management onsite for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include

1.3.1.1. Personnel and equipment decontamination.

1.3.1.2. Segregation of different Classifications.

1.4. Sequencing and Scheduling

1.4.1. Commence Work involving contact with Contaminated or potentially Contaminated Soil or Water after all applicable Environmental Protection procedures (including those identified in Contaminated Soil and Water Management Plan and Environmental Protection Plan) and facilities (including those identified in Site Layout) are operational and accepted by Departmental Representative.

1.4.2. Plan work sequencing and traffic patterns to prevent contamination of clean areas due to traffic or debris.

1.5. Drums

1.5.1. Provide, maintain, and operate drum staging pad as required.

1.5.2. Construct drum staging pad with sump capable of collecting leachate and rain runoff. Place impermeable liner that contours over top of berm, and collects leachate and runoff from staging pad which is conducted solely to sump on staging pad. Leachate is Contaminated Water.

1.5.3. Storage of solid or liquid waste: 200 L steel drums meeting Transportation of Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.6. Personnel Decontamination Facility

1.6.1. Provide an area or areas close to the workers' changing facilities to enable workers and other personnel leaving areas such as exclusion area to remove deleterious and Contaminated Soils from boots, clothing and skin surfaces.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.6.2. Be responsible for ensuring that all materials, chemicals, protective clothing, wash water and deleterious materials are collected, treated and disposed of in accordance with applicable environmental standards and regulations.
- 1.6.3. Personnel Decontamination Facility to be available for use by persons other than the Contractor's workers and Subcontractors, including federal employees, other contractor(s), and environmental agencies. Provide use of facilities to other persons.

1.7. Equipment Decontamination Facility

- 1.7.1. Prior to commencing Work involving equipment contact with potentially Contaminated Soil, construct equipment decontamination facilities to accommodate the largest potentially contaminated equipment onsite.
- 1.7.2. Collect and contain equipment decontamination wastewater and sediment. Transfer collected wastewater and sediment to treatment facilities accepted by Departmental Representative.

1.8. Equipment Decontamination

- 1.8.1. At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated.
- 1.8.2. If required, as directed by the Departmental Representative, use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean area before removing from Site or travelling on clean areas. Perform assessment as directed by the Departmental Representative to determine effectiveness of decontamination.
 - 1.8.2.1. Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.
 - 1.8.2.2. Collect decontamination wastewater and sediment which accumulate in decontamination location. Treat collected wastewater as Contaminated Water. Manage decontamination sediment as Waste Quality.
- 1.8.3. In the opinion of the Departmental Representative, each piece of equipment must be inspected by the Departmental Representative after decontamination and prior to travel on clean areas or demobilization from Site. Perform additional decontamination as required in the opinion of the Departmental Representative.
- 1.8.4. Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

1.9. Progress Decontamination

- 1.9.1. Decontaminate equipment after working in potentially contaminated Work areas and prior to subsequent Work or travel on clean areas.

1.10. Final Decontamination

- 1.10.1. Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially Contaminated Soil prior to demobilization from Site.

1.11. Contaminated Soil and Water Management

- 1.11.1. Remove all Contaminated Soil and Water within Work areas in accordance with the Contract and as directed by the Departmental Representative. Remove Non-Contaminated Quality Soil and Water incidental to the Work or as directed by the Departmental Representative.
- 1.11.2. Material and Water will be Classified by the Departmental Representative based on insitu results, field observations, field measurements, and/or ex-situ characterization. Departmental Representative responsible for Classification. Contractor cannot re-Classify material.
- 1.11.3. Handle (including Excavate, Transport, Treat, and Dispose) material separately into the classifications in accordance with the Contract or as directed by the Departmental Representative. Take necessary precautions to avoid mixing of different classifications. Do not blend, or mix and dilute, different material Classifications.
- 1.11.4. Contractor responsible for Transportation, Treatment, and Disposal based on Classification by Departmental Representative. Contractor responsible for material blended, or mixed and diluted, based on re-Classification by Departmental Representative. No increases to Contract Amount or Extension of Time due to material blended, or mixed and diluted.
- 1.11.5. Material characterization (eg sampling and testing) of parameters additional to information provided in Contract as required by the Contractor (eg for Transportation, Treatment Facility or Disposal Facility purposes) responsibility of Contractor.
- 1.11.6. Material segregation additional to Contract as required for Transportation, Treatment Facility or Disposal Facility responsibility of Contractor.

1.12. Soil Stockpile Construction

- 1.12.1. Stockpile material within work area in locations identified by Departmental Representative.
- 1.12.2. Provide, maintain, and operate temporary storage/stockpiling facilities as per Contractor's Site Layout.
- 1.12.3. Segregate Contaminated Soil into separate Classifications, and segregate Contaminated Soil from Non-Contaminated Quality Soil, into separate stockpiles to prevent cross-contamination.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.12.4. Prevent precipitation into Stockpiles from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each Working Day and as directed by the Departmental Representative.
- 1.12.5. Securely fasten covers over stockpiled material until material is loaded for transport.
- 1.12.6. Store excavated Non-Contaminated Quality Soil only on Non-Contaminated Quality surface areas. Ensure no contact between Non-Contaminated Quality Soil and Contaminated Soil.
- 1.12.7. Store excavated Contaminated Soil in temporary stockpiles.
 - 1.12.7.1. Install impermeable liner (eg asphalt or minimum 20 mil (0.5mm) polyethylene) below proposed stockpile locations to prevent contact between stockpile material and ground.
 - 1.12.7.2. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material. Cover to be impermeable (eg minimum 5 mil polyethylene) and securely fashioned to prevent blowing off.
 - 1.12.7.3. Prevent Non-Contaminated Quality Water, including surface runoff water, from coming into contact with Contaminated Soil stockpiles.
- 1.12.8. Segregate different suspect material in discrete stockpiles to facilitate ex-situ characterization for Classification as directed by the Departmental Representative.
- 1.12.9. Assist Departmental Representative in collection of stockpile samples for exsitu characterization. Ex-situ characterization may take up to 5 Working Days, not counting the day the sample is collected. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Samples results provided within 5 Working Days, not counting the day the sample is collected.
- 1.12.10. Do not remove Contaminated Soil from stockpiles until exsitu characterization completed and as directed by Departmental Representative.

1.13. Stockpile or Onsite Soil Treatment Facility Loading

- 1.13.1. Place Contaminated Soil in Stockpiles or Onsite Soil Treatment Facility in locations and thicknesses according to Contract.
- 1.13.2. Soil cannot be placed within 1.5m of the berms or sump to maintain adequate drainage and to avoid damaging the liner or geotextile material
- 1.13.3. Mechanical equipment cannot work within 1.5m of the sump or berms.
- 1.13.4. Trucks are only to operate in Stockpiles or Onsite Soil Treatment Facility when there is a minimum of 1m of soil present or as directed by the Departmental Representative. Trucks should minimize or eliminate turning while in facility. Trucks cannot dump directly on liner but only on areas with 1m of soil present and the dumped soil must remain 1.5m from the sump and berms when placed.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.13.5. Tracked equipment is only to operate in Stockpiles or Onsite Soil Treatment Facility when there is a minimum of 0.5m of soil present or as directed by the Departmental Representative.
- 1.13.6. Be responsible for, and make good repairs of, any damage to Stockpiles or Onsite Soil Treatment Facility caused by placement or amendment.

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

HEALTH AND SAFETY FOR CONTAMINATED SITES

PSPC Update on Asbestos Use

Effective April 1, 2016, all Public Services and Procurement Canada (PSPC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials.

COVID 19

All contractors shall follow Canadian Construction Association COVID-19 - Standardized Protocols for All Canadian Construction Sites, Provincial Regulations, and Federal Site Specific COVID 19 Procedures.

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

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. Site Specific Health and Safety Plan: within 7 Working Days after Contract award and prior to mobilization to Site, Submit a health and safety plan.

Include:

1.3.3.1. Results of site-specific safety hazard assessment.

1.3.3.2. Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

1.3.4. Submit digital copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

1.3.5. Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

1.3.6. Submit copies of incident and accident reports.

1.3.7. Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 10 days after receipt of comments from Departmental Representative.

1.3.8. Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.3.9. Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to

HEALTH AND SAFETY FOR CONTAMINATED SITES

commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

- 1.3.10. On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
- 1.3.11. Submit:
 - 1.3.11.1. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - 1.3.11.2. Emergency Procedures.
 - 1.3.11.3. Notice of 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. The Canadian Electric Code (as amended).
- 1.4.4. Canadian Standards Association (CSA) as amended:
 - 1.4.4.1. CSA Z797-2009 Code of Practice for Access Scaffold.
 - 1.4.4.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
 - 1.4.4.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
 - 1.4.4.4. CSA Z1006-10 Management of Work in Confined Spaces
 - 1.4.4.5. CSA Z462 Workplace Electrical Safety Standard.
- 1.4.5. National Fire Code of Canada 2010 (as amended):
 - 1.4.5.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
 - 1.4.5.2. FCC No. 302, Standard for Welding and Cutting.
- 1.4.6. American National Standards Institute (ANSI):
 - 1.4.6.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- 1.4.7. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - 1.4.7.1. Material Safety Data Sheets (MSDS).
- 1.4.8. Canadian Construction Association
 - 1.4.8.1. COVID-19 Standardized Protocols for All Canadian Construction Sites
- 1.4.9. Province of British Columbia (as appropriate):
 - 1.4.9.1. Workers Compensation Act Part 3-Occupational Health and Safety.
 - 1.4.9.2. Occupational Health and Safety Regulation.
- 1.4.10. Yukon Territory (as appropriate):
 - 1.4.10.1. Occupational Health and Safety Act.
 - 1.4.10.2. Workers' Compensation Act.
 - 1.4.10.3. Occupational Health and Safety Regulation

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.5. Worker's Compensation Board Coverage

- 1.5.1. Comply fully with the relevant Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the Final Completion of the Work.
- 1.5.2. Maintain Workers coverage as required by relevant acts and regulations during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.6. Compliance with Regulations

- 1.6.1. Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.
- 1.6.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - 1.6.2.1. Primary requirements:
 - 1.6.2.1.1. Contractor's safety policy.
 - 1.6.2.1.2. Identification of applicable compliance obligations.
 - 1.6.2.1.3. Definition of responsibilities for project safety / organization chart for project.
 - 1.6.2.1.4. General safety rules for project including COVID 19 protocols.
 - 1.6.2.1.5. Job-specific safe work procedures.
 - 1.6.2.1.6. Inspection policy and procedures.
 - 1.6.2.1.7. Incident reporting and investigation policy and procedures.
 - 1.6.2.1.8. Occupational Health & Safety Committee / Representative procedures.
 - 1.6.2.1.9. Occupational Health & Safety meetings.
 - 1.6.2.1.10. Occupational Health & Safety communications and record keeping procedures.
 - 1.6.2.2. 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 site work.
 - 1.6.2.3. List hazardous materials to be brought on site as required by work.
 - 1.6.2.4. Indicate Engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
 - 1.6.2.5. Identify personal protective equipment (PPE) to be used by workers.
 - 1.6.2.6. Identify personnel and alternates responsible for site safety and health.
 - 1.6.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.
- 1.6.3. 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.
- 1.6.4. Revise and update Health and Safety Plan as required and re-submit to the Departmental Representatives.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.6.5. Departmental Representative's review: the review of Site-Specific Health & Safety Plan by Public Services and Procurement Canada (PSPC) shall not relieve the Contractor of responsibility for errors or omissions in final Site Specific Health and Safety Plan or of responsibility for meeting all requirements of construction and contract documents.

1.7. General Requirements – Site Specific Safety Plan (SSSP/HASP)

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

1.8. Filing of Notice

- 1.8.1. The Prime Contractor must complete and submit a Notice of Project as required by Provincial or Territorial authorities.
- 1.8.2. Provide copies of all notices to the Departmental Representative.

1.9. Safety Assessment

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

1.10. Meetings

- 1.10.1. Attend health and safety pre-construction meetings and all subsequent meetings call by the Departmental Representative.

1.11. Regulatory Requirements

- 1.11.1. Do Work in accordance with Regulatory Requirements.

1.12. Responsibility

- 1.12.1. Assume responsibility as the Prime Contractor for work under this contract.
- 1.12.2. Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- 1.12.3. Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.13. Compliance Requirements

- 1.13.1. Comply with the CCA COVID-19 – Standardized Protocols for All Canadian Construction Sites.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.13.2. Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations
- 1.13.3. Comply with the B.C. Workers Compensation Act and Worksafe B.C. Occupational Health and Safety Regulations.
- 1.13.4. The most stringent will apply..

1.14. Unforeseen Hazards

- 1.14.1. When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Safety Officer and follow procedures in accordance with Acts and Regulations of Territory having jurisdiction and advise Departmental Representative verbally and in writing.

1.15. Health and Safety Coordinator

- 1.15.1. The Health and Safety Coordinator must:
 - 1.15.1.1. Be responsible for completing all health and safety training, ensure that personnel that do not successfully complete the required training are not permitted to enter the site to perform the work.
 - 1.15.1.2. Be responsible for implementing, daily enforcing, and monitoring the Site Specific Safety Plan (SSSP) or Health and Safety Plan (HASP).
 - 1.15.1.3. Be on site during execution of work.

1.16. Posting of Documents

- 1.16.1. Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Territory having jurisdiction, and in consultation with Departmental Representative.

1.17. Correction of Non-Compliance

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

1.18. Work Stoppage

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

1.19. Powder Actuated Devices

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

1.20. General Conditions

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.20.1. Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- 1.20.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - 1.20.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
 - 1.20.2.2. Secure site at nighttime or provide security guard as deemed necessary to protect site against entry.

1.21. Project/Site Conditions

- 1.21.1. Work at site will involve contact with:
 - 1.21.1.1. Multi-employer work site.
 - 1.21.1.2. Federal employees and general public.
 - 1.21.1.3. Energized electrical services.
 - 1.21.1.4. Working from heights.
 - 1.21.1.5. Working in open exposed to unpredictable weather.
 - 1.21.1.6. High volumes of vehicular and pedestrian traffic.
 - 1.21.1.7. Contaminants identified in Contract Documents and environmental reports.

1.22. Utility Clearances

- 1.22.1. The Contractor is solely responsible for all utility detection and clearances prior to starting the Work.
- 1.22.2. The Contractor will not rely solely upon the Reference Drawings or other information provided for utility locations.

1.23. Regulatory Requirements

- 1.23.1. Comply with specified codes, acts, bylaws, standards, and regulations to ensure safe operations at site (the most stringent will apply).
- 1.23.2. 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 advise on the course of action to be followed.

1.24. Work Permits

- 1.24.1. Obtain specialty permit(s) related to project before start of work.

1.25. Emergency Procedures

- 1.25.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e., names / telephone numbers) of:
 - 1.25.1.1. Designated personnel from own company.
 - 1.25.1.2. Regulatory agencies applicable to work and as per legislated regulations.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.25.1.3. Local emergency resources.
- 1.25.1.4. Departmental Representatives.
- 1.25.2. Include the following provisions in the emergency procedures:
 - 1.25.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency
 - 1.25.2.2. Evacuate all workers safely.
 - 1.25.2.3. Check and confirm the safe evacuation of all workers.
 - 1.25.2.4. Notify the fire department or other emergency responders.
 - 1.25.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - 1.25.2.6. Notify Departmental Representatives.
- 1.25.3. Provide written rescue / evacuation procedures as required for, but not limited to:
 - 1.25.3.1. Work at high angles.
 - 1.25.3.2. Work in confined spaces or where there is a risk of entrapment.
 - 1.25.3.3. Work with hazardous substances.
 - 1.25.3.4. Underground work.
 - 1.25.3.5. Work on, over, under, and adjacent to water.
 - 1.25.3.6. Workplaces where there are persons who required physical assistance to be moved.
- 1.25.4. Design and mark emergency exit routes to provide quick and unimpeded exit.

1.26. Hazardous Products

- 1.26.1. 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 Representatives and in accordance with the Canada Labour Code.
- 1.26.2. Where use of hazardous and toxic products cannot be avoided:
 - 1.26.2.1. Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 33 00.
 - 1.26.2.2. In conjunction with Departmental Representative, schedule to carry out work during “off hours” when tenants have left the building.
 - 1.26.2.3. Provide adequate means of ventilation in accordance with Section 01 51 00.
 - 1.26.2.4. The contractor shall ensure that the product is applied as per manufacturers recommendations.
 - 1.26.2.5. The contractor shall ensure that only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

1.27. Asbestos Hazard

- 1.27.1. Carry out any activities involving asbestos in accordance with applicable Provincial Regulations.

HEALTH AND SAFETY FOR CONTAMINATED SITES

1.27.2. Removal and handling of asbestos will be performed as indicated on the PSPC website.

1.28. PCB Removals

1.28.1. Mercury-containing fluorescent tubes and ballasts which contain polychlorinated biphenyls (PCBs) are classified as hazardous waste.

1.28.2. Removal, handle, transport, and dispose of as indicated on the PSPC website.

1.29. Removal of Lead Containing Paint

1.29.1. All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.

1.29.2. Carry out demolition activities involving lead-containing paints in accordance with applicable Provincials Regulations.

1.30. Electrical Safety Requirements

1.30.1. Comply with authorities and ensure that when installation new facilities or modifying existing facilities, all electrical personnel are completed familiar with existing and new electrical circuits and equipment and their operation.

1.30.1.1. Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.

1.30.1.2. Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.31. Electrical Lockout

1.31.1. Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

1.31.2. Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request / authorization form. Have procedures for review upon request by the Departmental Representatives.

1.31.3. Keep the documents and lockout tags at the site in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representatives or by any authorized safety representative.

1.32. Overloading

1.32.1. Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

1.33. Falsework

1.33.1. Design and construction falsework in accordance with CSA S269.1-1975 (R2003).

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1.34. Scaffolding

- 1.34.1. Design, construct, and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 and BC Occupational Health and Safety Regulations.

1.35. Confined Spaces

- 1.35.1. Carry out with confined spaces in compliance with Provincial Regulations.

1.36. Powder Actuated Devices

- 1.36.1. Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

1.37. Fire Safety and Hot Work

- 1.37.1. Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
- 1.37.2. Hot work includes cutting / melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

1.38. Fire Safety Requirements

- 1.38.1. Store oily / paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site daily.
- 1.38.2. Handle, store, use, and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- 1.38.3. Portable gas and diesel fuel tanks are not permitted on most federal work site. Approval from the DR is required prior to any gas or diesel tank being brought onto the work site.

1.39. Fire Protection and Alarm System

- 1.39.1. Fire protection and alarm shall not be:
- 1.39.1.1. Obstructed.
- 1.39.1.2. Shut off.
- 1.39.1.3. Left inactive at the end of a working day or shift.
- 1.39.2. Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- 1.39.3. Be responsible / liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

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1.40. Unforeseen Hazards

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

1.41. Posted Documents

- 1.41.1. Post legible versions of the following documents on site:
- 1.41.1.1. Site Specific Health and Safety Plan
 - 1.41.1.2. Sequence of work
 - 1.41.1.3. Emergency procedures
 - 1.41.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
 - 1.41.1.5. Notice of Project
 - 1.41.1.6. Floor plans or site plans
 - 1.41.1.7. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
 - 1.41.1.8. Workplace Hazardous Materials Information System (WHMIS) documents.
 - 1.41.1.9. Material Safety Data Sheets (MSDS)
 - 1.41.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- 1.41.2. Post all Material Safety Data Sheets (MSDS) on site, 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.
- 1.41.3. 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 approved by the Departmental Representative.

1.42. Meetings

- 1.42.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
- 1.42.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
- 1.42.2.1. Sign-in of all attendees.
 - 1.42.2.2. Planned Work activities and environmental considerations for that shift.
 - 1.42.2.3. Hazards associated with these Work activities, including environmental hazards (eg potential for hypothermia, heat exhaustion, heat stroke).
 - 1.42.2.4. Appropriate job-specific safe work procedures.
 - 1.42.2.5. Required personal protective equipment (PPE).
 - 1.42.2.6. Appropriate emergency procedures.
 - 1.42.2.7. Review recent accidents on Site, including near misses.

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- 1.42.3. 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.

1.43. Hazardous Occurrence Investigation, Recording and Reporting (HOIRR)

1.43.1. Hazard includes:

- 1.43.1.1. Any source of potential damage, harm or adverse effects on life, health, property or environment at work. It refers to any biological, chemical, ergonomic, physical, psychosocial and safety factor that is reasonably likely to cause harm or damage to humans, other organisms, or the environment in the absence of its control. Sometimes a hazard is referred to as being the actual harm or the health effect it caused rather than the hazard. For example the disease tuberculosis might be called a hazard by some but in general the tuberculosis-causing bacteria would be considered the “hazard” or “hazardous biological agent”. Exposure to tuberculosis would be the hazardous incident. For types of Hazards refer to Annex 3 of the Standard on Hazard Prevention Program.

1.43.2. Hazardous Occurrence includes:

- 1.43.2.1. An event occurring at a PWGSC managed building or worksite, or through the course of an employee's work that results in, or has the potential to result in, a fatality, injury, illness, exposure to a hazardous substance or property damage or an escapement of a hazardous material. For the purpose of investigating, recording and reporting hazardous occurrences, the following are included under this term: disabling injuries, minor injuries and near-misses.

1.43.3. Hazardous Occurrence Investigation and Reporting Procedures:

- 1.43.3.1. Includes information regarding the person involved and the basic circumstances surrounding the hazardous occurrence.
- 1.43.3.2. Provides a detailed and thorough description of the hazardous occurrence and the sequence of events.
- 1.43.3.3. Indicates corrective measures that have been taken since the occurrence.
- 1.43.3.4. Requires the appointment of a qualified investigator.
- 1.43.3.5. Provides recommendations for additional corrective measures, if required.

1.43.4. Fatal or Serious Accidents Procedures:

- 1.43.4.1. Call emergency number to advise the police organization having jurisdiction to secure the scene and investigate the matter.
- 1.43.4.2. Advise the Departmental Representative of the fatality or serious accident within 1 hour.
- 1.43.4.3. No investigation will be conducted at the scene until the police service having jurisdiction has released the scene.
- 1.43.4.4. Unless authorized to do so, do not allow anyone to remove or in any way interfere with or disturb any wreckage, article or thing related to the incident except to the extent necessary to: save a life, prevent injury or relieve human

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suffering in the vicinity; maintain an essential public service; or prevent unnecessary damage to or loss of property.

1.44. Personal Protective Equipment Program

- 1.44.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing as appropriate:
 - 1.44.1.1. Donning and doffing procedures.
 - 1.44.1.2. PPE selection based upon Site hazards.
 - 1.44.1.3. PPE use and limitations of equipment.
 - 1.44.1.4. Work mission duration, PPE maintenance and storage.
 - 1.44.1.5. PPE decontamination and disposal.
 - 1.44.1.6. PPE inspection procedures prior to, during, and after use.
 - 1.44.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
 - 1.44.1.8. Medical surveillance requirements for personnel assigned to work at Site.
 - 1.44.1.9. 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.
 - 1.44.1.10. 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.
 - 1.44.1.11. Decontamination procedures for both personnel and equipment.
 - 1.44.1.12. 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.
 - 1.44.1.13. Written respiratory protection program for project activities.
 - 1.44.1.14. Procedures dealing with heat and/or cold stress.
 - 1.44.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

1.45. Offsite Contingency and Emergency Response Plan

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

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- 1.45.2. 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.

1.46. Personnel Health, Safety, and Hygiene

- 1.46.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
- 1.46.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.
- 1.46.3. Personal Protective Equipment:
 - 1.46.3.1. Ensure all site personnel are furnished with appropriate PPE.
 - 1.46.3.2. Unless identified otherwise in site-specific health and safety plan, minimum PPE to include: industrial protective headwear, high-visibility safety apparel, and protective footwear.
 - 1.46.3.3. Ensure that safety equipment and protective clothing is kept clean and maintained.
- 1.46.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - 1.46.4.1. Ensure industrial protective headwear is of appropriate CSA Standard and meets other appropriate standards.
 - 1.46.4.2. Ensure high-visibility safety apparel is of appropriate CSA Standard and meets other appropriate standards.
 - 1.46.4.3. Ensure protective footwear is of appropriate CSA Standard and meets other appropriate standards.
 - 1.46.4.4. Dispose of or decontaminate PPE worn onsite at end of each workday.
 - 1.46.4.5. Decontaminate reusable PPE before reissuing.
 - 1.46.4.6. Ensure site personnel have passed respirator fit test prior to entering potentially volatile contaminated work areas, as appropriate.
 - 1.46.4.7. Ensure facial hair does not interfere with proper respirator fit.
- 1.46.5. Respiratory Protection:
 - 1.46.5.1. 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.
 - 1.46.5.2. Develop, implement, and maintain respirator program.
 - 1.46.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.
 - 1.46.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.
 - 1.46.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.

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- 1.46.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.
- 1.46.5.7. 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.
- 1.46.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- 1.46.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
 - 1.46.7.1. Suitable containers for storage and disposal of used disposable PPE.
 - 1.46.7.2. Potable water and suitable sanitation facility.
- 1.46.8. Emergency and First-Aid Equipment:
 - 1.46.8.1. 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.
- 1.46.9. Site Communications:
 - 1.46.9.1. Identify, provide and implement appropriate dedicated communication devices for Site and post emergency numbers near dedicated devices.
 - 1.46.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
 - 1.46.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
 - 1.46.9.4. Furnish selected personnel with 2-way radios.
 - 1.46.9.5. 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.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Non-Contaminated Quality Soil Transport and Disposal will be paid in accordance with unit rate price established for weight of material disposed. Measurement as recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative on Certificates of Disposal. Includes Treatment or any other processing of material required by Disposal Facility but not required by the Contract.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Environmental Protection Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing protection of the environment. Include:
- 1.3.1.1. Comprehensive overview of known or potential environmental issues to be addressed during Work.
 - 1.3.1.2. Identify requirements that plan complies with. Includes: permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.
 - 1.3.1.3. Communications identifying emergency contact list and conditions for implementing emergency contact. Emergency contact to include: Contractor emergency response team including Superintendent; Departmental Representative and alternate, and other contractor(s) and individuals as directed by the Departmental Representative; and federal, provincial, and municipal emergency contacts.
 - 1.3.1.4. Work Area showing proposed activity in each portion of areas, such as exclusion zone(s), decontamination zone(s) and clean zone(s), and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas.
 - 1.3.1.5. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials onsite.
 - 1.3.1.6. Historical, Archaeological, Cultural Resources, Biological Resources and Valued Habitat Protection identifying methods, means, and sequences for preventing, monitoring, and controlling protection of historical, archaeological, cultural resources, biological resources and valued habitat. Include procedures if previously unknown historical, archaeological, cultural,

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- and biological resources are discovered during Work. Includes Species At Risk.
- 1.3.1.7. Non-Contaminated Quality Soil and Water Management including onsite handling to manage Solid Waste, Sewage, and Wastewater.
 - 1.3.1.8. Non-Contaminated Quality Soil Transport and Disposal including transportation frequency and identifying offsite disposal facilities to manage Solid Waste. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the disposal of relevant Non-Contaminated Material.
 - 1.3.1.9. Traffic Management Plan including signage and traffic control personnel for Site ingress and egress. Traffic Management Plan, vehicles and vehicle traffic must comply with all federal, provincial, and municipal laws and regulations.
 - 1.3.1.10. Noise Control identifying methods, means, and sequences for preventing, monitoring, and controlling noise for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: noise does not comply with appropriate levels, or if there are public complaints.
 - 1.3.1.11. Vibration Control identifying methods, means, and sequences for preventing, monitoring, and controlling vibration for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; in accordance with the Contract; in accordance with recommendations from the Contractor's Qualified Professional. Include thresholds and procedures if: vibration does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.
 - 1.3.1.12. Vapours, Dust, and Particulate Control identifying methods, means, and sequences for preventing, monitoring, and controlling vapours, dust and other airborne particulates for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: vapours, dust, and particulates do not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.
 - 1.3.1.13. Spill Control identifying methods, means, and sequences for preventing, monitoring, and controlling spills for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Identify reporting requirements for spills. Identify locations and contents of spill kits.
 - 1.3.1.14. Erosion and Sediment Control identifying methods, means, and sequences for preventing, monitoring, and controlling onsite surface water, erosion and

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- sedimentation for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.
- 1.3.1.15. Work in or Adjacent to Waterways Control, as required, identifying methods, means, and sequences for preventing, monitoring, and controlling work in or adjacent to waterways for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include measures for protection of fish and wildlife during Work in or Adjacent to Waterways including isolation and dewatering of work zones and monitoring. Include coordination with owner's Environmental Consultant for fish and wildlife salvage prior to Work in or Adjacent to Waterways.
- 1.3.1.16. Monitoring requirements for general compliance with Environmental Protection Plan.
- 1.3.1.17. Environmental Protection Plan must be signed and sealed by Contractor's Qualified Professional, as required by potential impact to environment by Contractor's methods, means and sequences.
- 1.3.2. Submit amended Environmental Protection Plan if there are changes to the assumed site conditions, changes to the Work procedures, or in the event that any methods and procedures are inadequate as directed by the Departmental Representative.
- 1.3.3. Submit Spill and Response Report for all Spills. Include: description of spill (location, time, quantity and quality), notifications (including copies of any reports forwarded to regulatory agencies), and describe any remediation activities (time, quantity, quality, and fate of spill impacted material). Include environmental analytical results for spill or other environmental testing.
- 1.3.4. After hours work: at least 5 Working Days prior to commencing after hours work Submit a schedule showing requested dates, times, and reasons for after hours work. Approval will only be granted for reasons valid, if request can be reasonably accommodated by other contractors and Site users, and third parties are not adversely affected, in the sole opinion of the Departmental Representative.

1.4. Contractor's Qualified Professional

- 1.4.1. Perform design, construction, monitoring, reporting, and other required tasks under the supervision of the Contractor's Qualified Professional applicable to the performance of the Work.

1.5. Cleaning

- 1.5.1. Maintain cleanliness of Work and surrounding Site to comply with federal, provincial, and municipal fire and safety laws, ordinances, codes, and regulations applicable to the performance of the Work.

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- 1.5.2. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.
- 1.5.3. Ensure cleanup of the Work areas each day after Final Completion of Work.

1.6. Site Clearing and Plant Protection

- 1.6.1. Minimize stripping of Topsoil and vegetation. Use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction.
- 1.6.2. Restrict tree and plant removal to areas in accordance with the Contract or as directed by the Departmental Representative. To greatest extent practicable, prune or top the vegetation instead of grubbing/uprooting. Protect all other trees and plants onsite and offsite.
- 1.6.3. Salvage all trees and plants to be removed in accordance with the Contract or as directed by the Departmental Representative.
- 1.6.4. Wrap salvaged trees in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- 1.6.5. Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- 1.6.6. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
- 1.6.7. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
- 1.6.8. Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
- 1.6.9. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.

1.7. Archaeological

- 1.7.1. Attend archaeological awareness training provided by Departmental Representative.
- 1.7.2. Abide by Chance Find Procedures developed by Departmental Representative, as appropriate.

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1.8. Species At Risk

- 1.8.1. Protect all Species At Risk, including meeting all federal, provincial, and municipal laws and regulations.
- 1.8.2. Modify Work procedures, including stopping Work, as instructed by Contractor's Qualified Professional or Departmental Representative to protect Species At Risk.

1.9. Non-Contaminated Quality Soil and Water Management

- 1.9.1. Solid waste
 - 1.9.1.1. Remove all Non-Contaminated Quality Soil within Work areas in accordance with the Contract and as directed by the Departmental Representative.
 - 1.9.1.2. Remove surplus materials and temporary facilities from Site.
 - 1.9.1.3. Do not burn or bury any waste onsite.
 - 1.9.1.4. Do not discharge wastes into streams or waterways.
 - 1.9.1.5. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 1.9.1.6. Dispose of all Non-Contaminated Quality Soil at a Landfill Facility.
- 1.9.2. Sewage
 - 1.9.2.1. Store Sewage from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.
 - 1.9.2.2. Provide, operate, and maintain Sewage storage tanks to store Sewage.
 - 1.9.2.3. Transport and dispose of Sewage at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.
 - 1.9.2.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage to Site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain approval prior to discharge of Sewage.
- 1.9.3. Wastewater
 - 1.9.3.1. Dewater various parts of Work including, excavations, structures, foundations, and Work areas, unless otherwise specified or directed by Departmental Representative.
 - 1.9.3.2. Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
 - 1.9.3.3. Direct surface waters that have not contacted potentially Contaminated Material to surface drainage systems.
 - 1.9.3.4. Control surface drainage including ensuring that gutters are kept open, wastewater is not allowed across or over pavements or sidewalks except through accepted pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.
 - 1.9.3.5. Dispose of Wastewater in manner not injurious to public health or safety, to the environment, to onsite or offsite property, or to any part of Work completed or under construction.

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- 1.9.3.6. Control disposal or runoff of Wastewater containing suspended materials or other harmful substances in accordance with local authority requirements.
- 1.9.3.7. Ensure pumped Wastewater into waterways, sewer or drainage systems is free of suspended materials. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.
- 1.9.3.8. Obtain permits to discharge Wastewater to environment or municipal system (sewer, ditches).
- 1.9.3.9. Do not discharge water which may have come in contact with potentially Contaminated Soil or otherwise be Contaminated directly offsite to the environment or to municipal system.

1.10. Non-Contaminated Quality Soil Transport and Disposal

- 1.10.1. Assume ownership of, and be responsible for, Non-Contaminated Quality Soil once it is loaded on a vehicle, barge, or other vessel for Transport. Assume ownership of, and be responsible for, Non-Contaminated Quality Soil Disposed.
- 1.10.2. Transport material as soon as practical; do not unreasonably stockpile onsite.
- 1.10.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.
- 1.10.4. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
- 1.10.5. Stabilize material as necessary.
- 1.10.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Non-Contaminated Quality Soil.
- 1.10.7. Barges must be inspected by an independent Marine Surveyor for stability and safety.
- 1.10.8. Non-Contaminated Quality Soil Disposal: dispose all Non-Contaminated Quality Soil, at Landfill Facility provided by Contractor and accepted by the Departmental Representative.
- 1.10.9. Landfill Facility must:
 - 1.10.9.1. Be an existing offsite facility located in Canada or the United States.
 - 1.10.9.2. 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.
 - 1.10.9.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by the BC government or the Yukon government, as appropriate, for the Disposal of relevant Non-Contaminated Quality Soil.
 - 1.10.9.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the BC Environmental Management Act and BC Landfill Criteria for Municipal

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Solid Waste, or Yukon Environment Act and Yukon Solid Waste Regulations, municipal zoning bylaws, or equivalent.

- 1.10.10. Dispose material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
- 1.10.11. Material sent to a Landfill Facility must be permanently stored at that facility.
- 1.10.12. If proposed Landfill Facility is not acceptable to Departmental Representative, provide an alternate Landfill Facility that is acceptable.

1.11. Public Traffic Management

- 1.11.1. Where applicable, traffic to include pedestrian traffic.
- 1.11.2. Ensure pedestrians have safe and unencumbered access in public areas. Provide traffic control personnel wherever Contractor's activities (including vehicle crossings) impedes sidewalks, pathways, bike paths, roadways, or other public routes, or elsewhere as required or as directed by Departmental Representative.
- 1.11.3. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- 1.11.4. Comply with requirements of acts, regulations and bylaws 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.
- 1.11.5. Comply with current version of WorkSafeBC Occupational Health and Safety Regulation *Part 18 Traffic Control* or Yukon Workers' Compensation Health and Safety Board Occupational Health and Safety Act and Regulations *Public Way 1.46 and 1.47*, as appropriate.
- 1.11.6. Comply with current version of BC Ministry of Transportation and Infrastructure *2015 Interim Traffic Management Manual for Work on Roadways*.
- 1.11.7. Obtain all necessary permits or other authorizations regarding traffic control, including access and road usage.
- 1.11.8. Provide and maintain road access and egress to property fronting Site and in other areas in accordance with the Contract, except where other means of road access exist that are accepted.
- 1.11.9. Prevent tracking or spilling of debris or material onto private and public roads.
- 1.11.10. Immediately sweep or scrape up debris or material on private and public roads.
- 1.11.11. Clean public roads within a minimum 200 m radius of the Site entrance or as required at least once per shift, or as directed by Departmental Representative.
- 1.11.12. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.12. Noise, Vibration, Vapours, and Dust Control

- 1.12.1. Maintain acceptable levels not injurious or objectionable to worker safety, public health, the environment, and equipment and infrastructure.
- 1.12.2. Comply with applicable municipal bylaws and other applicable requirements unless otherwise specified or directed by Departmental Representative; Contractor's Qualified Professional to may determine lower acceptable levels.
- 1.12.3. Maximum levels allowed at site boundaries to prevent nuisance, unless otherwise accepted by Departmental Representative:
 - 1.12.3.1. Noise: 65 dBa.
 - 1.12.3.2. Vibration: 0.315 m/s^2 (based on ISO 2631-1).
 - 1.12.3.3. Dust PM_{10} : $50 \mu\text{g/m}^3$.
- 1.12.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
- 1.12.5. Specific procedures to prevent dust:
 - 1.12.5.1. Cover or wet down relevant Work to prevent vapours and blowing dust and debris, including temporary roads, excavations, and stockpiles. In urban environments or if sensitive neighbouring properties (eg residences) provide full time coverage or wetting down.
 - 1.12.5.2. Covers to be impermeable (eg minimum 5 mil polyethylene) and securely fashioned to prevent blowing off. Use fresh (non-saline) water for dust and particulate control.
 - 1.12.5.3. Use appropriate covers on vehicles, including trucks, barges, and trains, hauling vapour-generating or fine or dusty material. Use watertight vehicles to haul wet materials.

1.13. Spill Control

- 1.13.1. Pollution includes spills or other releases from Contractor's activities that could potentially contaminate soil, sediment, water, and atmosphere from discharge of hazardous, deleterious or regulated substances, including from equipment and material handling.
- 1.13.2. Prevent spills or releases.
 - 1.13.2.1. Maintain temporary erosion and pollution control features.
 - 1.13.2.2. Do not store fuel onsite other than tanks forming part of the equipment.
 - 1.13.2.3. Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
 - 1.13.2.4. Control emissions from equipment and plant to meet applicable authorities' emission requirements.

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- 1.13.2.5. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.
- 1.13.3. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.
- 1.13.4. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.
 - 1.13.4.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.
 - 1.13.4.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.
 - 1.13.4.3. Spill kits are to be in close proximity to machinery.
 - 1.13.4.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.
- 1.13.5. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- 1.13.6. Promptly report spills and releases potentially causing damage to environment to:
 - 1.13.6.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - 1.13.6.2. Contractor emergency response team including Superintendent.
 - 1.13.6.3. Departmental Representative and other contractor(s) and individuals as directed by the Departmental Representative.
- 1.13.7. Departmental Representative can collect samples for chemical analyses prior to, during, and upon Final Completion of Work to monitor potential pollution caused by Contractor's activities. Assist Departmental Representative in collection of samples.
- 1.13.8. Remediation of soil, sediment or water contaminated by Contractor's activities.
 - 1.13.8.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.
 - 1.13.8.2. Remediation includes excavation, pumping, testing, transport, treatment and disposal as appropriate for the type of contamination incurred, and at a minimum in accordance with the Contract.
 - 1.13.8.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.
 - 1.13.8.4. Remediate as directed by the Departmental Representative.
 - 1.13.8.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.
- 1.13.9. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not

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proceed with stopped Work until corrections accepted by Departmental Representative.

1.14. Erosion and Sediment Control

- 1.14.1. Implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear.
- 1.14.2. Install effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
- 1.14.3. Manage water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
- 1.14.4. Implement site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).
- 1.14.5. Contain and stabilize waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
- 1.14.6. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
- 1.14.7. Repair erosion and sediment control measures and structures if damage occurs.
- 1.14.8. Remove non-biodegradable erosion and sediment control materials once site is stabilized.
- 1.14.9. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate, when reasonable use of neighbouring properties are impacted, or when monitoring indicates that levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.15. Work In or Adjacent to Waterways

- 1.15.1. Approvals and Practices:
 - 1.15.1.1. As required, comply with Fisheries Act Approval and other relevant authorizations, permits and approvals and in accordance with the Contract. Obtain amendments as required by Contractor's methods, means, and sequences only if recommended by Contractor's Qualified Professional and accepted by Departmental Representative.
 - 1.15.1.2. Restrict Work as described in, and follow requirements in, Contract including Environmental Effects Determination, Environmental Management Plan,

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- Aquatic Effects Assessment, Environmental Mitigation Strategy, or similar documents. Variations allowed only if recommended by Contractor's Qualified Professional and accepted by Departmental Representative.
- 1.15.1.3. Follow practices described in *Land Development Guidelines for the Protection of Aquatic Habitat* (Fisheries and Oceans Canada/Ministry of Environment, Lands and Parks, 1993 September) and *Measures to avoid causing harm to fish and fish habitat including aquatic species at risk* (Fisheries and Oceans Canada, 2018 December 14).
 - 1.15.1.4. Follow practices described in *Standards and Best Practices for Instream Works* (BC Ministry of Environment, 2004 March).
 - 1.15.2. Timing
 - 1.15.2.1. Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
 - 1.15.2.2. Minimize duration of in-water work.
 - 1.15.2.3. Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
 - 1.15.2.4. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
 - 1.15.3. Site Selection
 - 1.15.3.1. Design and plan activities and works in wetland and waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
 - 1.15.3.2. Design and construct approaches to wetland and waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation. Design a Site Access Plan detailing areas of access and egress to Waterways and including equipment types and methods to limit riparian vegetation clearing for approval by the Departmental Representative.
 - 1.15.3.3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or the built structures.
 - 1.15.3.4. Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.
 - 1.15.4. Shoreline/bank Re-vegetation and Stabilization
 - 1.15.4.1. Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting. Coordinate with Departmental Representative for fish and wildlife salvage prior to conducting Work within or Adjacent to waterbodies
 - 1.15.4.2. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary

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- high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed. Coordinate with Departmental Representative to conduct pre-clearing nesting bird surveys prior to vegetation clearing
- 1.15.4.3. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
 - 1.15.4.4. Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
 - 1.15.4.5. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
 - 1.15.4.6. Remove all construction materials from site upon project completion.
 - 1.15.4.7. Do not remove riparian vegetation if the riparian area is identified as part of critical habitat of an aquatic listed Species At Risk.
- 1.15.5. Aquatic Life Protection
- 1.15.5.1. Ensure that all in-water activities, or associated in-water structures, do not interfere with aquatic life passage, constrict the channel width, or reduce flows, or result in the stranding or death of aquatic life.
 - 1.15.5.2. Contractor's Qualified Professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
 - 1.15.5.3. Any capture and relocation of an endangered or threatened aquatic Species At Risk will require approval from Department of Fisheries and Oceans.
- 1.15.6. Water Intake or Outlet Pipe Screening:
- 1.15.6.1. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - 1.15.6.2. Screens should be located in areas and depths of water with low concentrations of fish throughout the year.
 - 1.15.6.3. Screens should be located away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - 1.15.6.4. The screen face should be oriented in the same direction as the flow.
 - 1.15.6.5. Ensure openings in the guides and seals are less than the opening criteria to make "fish tight".
 - 1.15.6.6. Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.

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- 1.15.6.7. Structural support should be provided to the screen panels to prevent sagging and collapse of the screen.
- 1.15.6.8. Large cylindrical and box-type screens should have a manifold installed in them to ensure even water velocity distribution across the screen surface. The ends of the structure should be made out of solid materials and the end of the manifold capped.
- 1.15.6.9. Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where there is debris loading (woody material, leaves, algae mats, etc.). A 150 mm (6 in.) spacing between bars is typical.
- 1.15.6.10. Provision should be made for the removal, inspection, and cleaning of screens.
- 1.15.6.11. Ensure regular maintenance and repair of cleaning apparatus, seals, and screens is carried out to prevent debris-fouling and impingement of fish.
- 1.15.6.12. Pumps should be shut down when fish screens are removed for inspection and cleaning.
- 1.15.7. Explosives:
 - 1.15.7.1. Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
 - 1.15.7.2. Do not use explosives where SARA-listed aquatic species, their residences or critical habitat occur, without review by Department of Fisheries and Oceans.
- 1.15.8. Operation of Machinery
 - 1.15.8.1. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
 - 1.15.8.2. Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
 - 1.15.8.3. Limit machinery fording of the watercourse to a one-time event (ie over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
 - 1.15.8.4. Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (eg dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (eg swamp mats, pads) if minor rutting is likely to occur during fording.
 - 1.15.8.5. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

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- 1.15.8.6. Do not ford, place crossing materials or operate machinery on the bed of a waterbody where SARA-listed shellfish occur, or critical habitat or residences of freshwater SARA-listed aquatic species occur.

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

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Site Facilities - Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure in accordance with the Contract. Includes site preparation, temporary structures and facilities, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utility services.
- 1.1.2. Site Facilities - Operation will be paid in accordance with lump sum price established to operate and maintain all infrastructure between mobilization and demobilization. Includes site preparation, temporary structures and facilities, environmental protection, stockpile areas, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, stormwater management infrastructure, lighting, and utilities. Also includes ongoing services including administration, overhead, project management, security, surveying, noise monitoring, vibration monitoring, utility services, project meetings, inspections, progress Submittals, traffic control, health and safety, Environmental Protection, cleaning, and operation during inclement weather. Also includes living out allowances, travel and room and board. Lump sum may be pro-rated based on duration in Master Plan for Extension of Time.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Site Layout: within 10 Working Days after Contract award and prior to mobilization to Site, Submit Site Layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor. Include:
 - 1.3.1.1. Equipment and personnel decontamination areas.
 - 1.3.1.2. Means of ingress, egress and temporary traffic control.
 - 1.3.1.3. Equipment and material staging areas.
 - 1.3.1.4. Stockpile areas and construction details, including base preparation and water control features.
 - 1.3.1.5. Exclusion areas, contaminant handling areas, and other areas identified in Contractor's site-specific Health and Safety Plan and Environmental Protection Plan.
 - 1.3.1.6. Grading, including contours, required to construct temporary facilities.
 - 1.3.1.7. Location of all temporary facilities including: Onsite Contaminated Water Treatment Plant, truck wash and decontamination units, office trailers,

modular camp structures, parking, storage, environmental monitoring stations, above ground and underground utilities, roads, and other temporary facilities.

- 1.3.2. Signs: at least 5 Working Days prior to posting, Submit any signs viewable by public.

1.4. Examination

- 1.4.1. Site Verification of Conditions:

- 1.4.1.1. Contractor to determine condition of existing Site and requirements to make the Site suitable for Work.

1.5. Site Preparation

- 1.5.1. Site Preparation and operation includes construction, operation and maintenance for the duration of the Work,
- 1.5.2. Remove and dispose all surficial Non-Contaminated Quality Soil at a Landfill to allow access for Work.
- 1.5.3. Clearing and grubbing of the Site to allow access for Work.
- 1.5.3.1. Clearing consists of removing Non-Contaminated Quality Soil vegetation above existing ground surface to facilitate Work. Includes: cutting off trees and brush vegetative growth, felled trees, previously uprooted trees and stumps. Dispose of Non-Contaminated Quality Soil at a Landfill.
- 1.5.3.2. Grubbing consists of excavation of Non-Contaminated Quality Soil below existing ground surface to facilitate Work. Includes: stumps, roots, boulders and rock fragments. Dispose of Non-Contaminated Quality Soil at a Landfill.
- 1.5.4. Remove obstructions, ice and snow, from surfaces to be worked.

1.6. Utility Services

- 1.6.1. Utility Services (including electrical power, potable water, sewers, and telecommunications) not identified as being available on Site must be supplied at the Contractor's expense. Provide supplied utilities for entire work force, including Subcontractors and Departmental Representative and their consultants.

1.7. Sanitary Facilities

- 1.7.1. Provide sanitary facilities for work force (including Contractor, Subcontractors, Departmental Representative, and Consultants) in accordance with governing regulations and ordinances.
- 1.7.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.8. Fire Protection

- 1.8.1. Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

1.9. Access and Delivery

- 1.9.1. Only the designated entrance in accordance with the Contract can be used for access to Site.
 - 1.9.1.1. Maintain for duration of Contract.
 - 1.9.1.2. Make good damage resulting from Contractor's use.
- 1.9.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

1.10. Installation and Removal

- 1.10.1. Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- 1.10.2. Identify areas which have to be graveled or otherwise treated to prevent tracking of mud.
- 1.10.3. Indicate use of supplemental or other staging area.
- 1.10.4. Provide construction facilities in order to execute work expeditiously.
- 1.10.5. Provide temporary utilities in order to execute Work expeditiously.
- 1.10.6. Remove from Site all such Work after use.

1.11. Site Storage/Loading

- 1.11.1. Confine work and operations of employees in accordance with the Contract. Do not unreasonably encumber premises with products.
- 1.11.2. Storage space must be limited to the Site.
- 1.11.3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.12. Construction Parking

- 1.12.1. Parking of private vehicles will not be permitted on Site, unless otherwise agreed to by Departmental Representative.
- 1.12.2. Provide and maintain adequate access to project site.

1.13. Security

- 1.13.1. Be responsible security of site and contents of site after working hours and during holidays. Provide onsite security personnel as appropriate and in accordance with the Contract.
- 1.13.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative.

1.14. Departmental Representative and Consultant Offices

- 1.14.1. Provide office facilities for the exclusive use of the Departmental Representative and their consultants with the following minimum intent, modified as per the Contract, or as directed by the Departmental Representative:
 - 1.14.1.1. Two work stations within factory fabricated modular units.

- 1.14.1.2. Work stations must include; 1 desk (minimum size 120 cm x 50 cm, minimum height 70 cm), 1 swivel desk chair (minimum load requirement 100 kg), 1 bookshelf (minimum 3 shelves with a minimum shelf height of 32 cm), 1 locking filing cabinet (minimum dimensions 50 cm x 39 cm x 60 cm), 1 garbage can, and 1 recycling bin.
- 1.14.1.3. Building envelope: watertight construction.
- 1.14.1.4. Completed building: exterior to interior minimum sound attenuation of STC 30.
- 1.14.1.5. Building interior environment: heated and cooled to maintain temperature of 20 degrees C minimum to 25 degrees C maximum with relative humidity of 35% to 60%.
- 1.14.1.6. Provide ventilation and outdoor air as per ASHRAE 62.1 – 2010 Standard.
- 1.14.1.7. Building lighting: maintain measured lighting level of 200 lx at 1500 mm above finished floor, after building finishes and painting complete.
- 1.14.1.8. Thermal performance of window units: Maximum heat transfer rate (U-value) not to exceed 2.0 W/m²K.
- 1.14.1.9. Regularly collect refuse and recyclables and keep the office clean and properly maintained with heat and light.
- 1.14.1.10. Provide private washroom facilities in offices in accordance with the Contract, complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
- 1.14.1.11. The work stations and contents must be for the sole use of the Departmental Representative and their consultant(s) for the duration of the Work and may, if necessary, be used concurrently with other inspection agencies.
- 1.14.2. Installation:
 - 1.14.2.1. Install level and plumb.
 - 1.14.2.2. Install stairs.
 - 1.14.2.3. Adjust doors and windows for smooth operation.
- 1.14.3. Provide a minimum of 2 parking spaces for Departmental Representative and their consultants adjacent to offices.

1.15. Equipment, Tools and Materials Storage

- 1.15.1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- 1.15.2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.16. Construction Signage

- 1.16.1. Provide and erect 2 project signs within 10 Working Days of mobilization in a location designated by Departmental Representative. Project signs must, unless otherwise directed by Departmental Representative, include: name of Client, name of Project, and information contact number in both official languages

using graphic symbols to CAN/CSA-Z321. Project signs to be a minimum of 1200 x 2400mm.

- 1.16.2. Contractor signage must be accepted by Departmental Representative.
- 1.16.3. Contractor signage must include at a minimum:
 - 1.16.3.1. Name of Contractor.
 - 1.16.3.2. Emergency contact number.
 - 1.16.3.3. Personal Protective Equipment requirements.
 - 1.16.3.4. Other pertinent safety warnings (eg “open excavation”).
- 1.16.4. Maintain accepted signs and notices in good condition for duration of project, and dispose of offsite on completion of project or earlier if directed by Departmental Representative.

1.17. Onsite Traffic Management

- 1.17.1. Where applicable, traffic to include pedestrian traffic.
- 1.17.2. Provide access and temporary relocated roads as necessary to maintain traffic.
- 1.17.3. Maintain and protect traffic on affected roads during construction period.
- 1.17.4. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- 1.17.5. Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- 1.17.6. Verify adequacy of existing roads and allowable load limit on these roads. Contractor responsible for repair of damage to roads caused by construction operations.

1.18. Onsite Roads

- 1.18.1. Where applicable, traffic to include pedestrian traffic.
- 1.18.2. Construct, operate and maintain the onsite access roads as required.
- 1.18.3. Design of temporary onsite access roads to be signed and sealed by Contractor's Qualified Professional.
- 1.18.4. Contractor's Qualified Professional to confirm that the temporary onsite access roads allow for the safe transport of materials and equipment.
- 1.18.5. Any temporary access, detour and haul roads associated with the project must be constructed to accommodate all required uses and be maintained throughout the course of construction operations in a safe, environmentally sound manner.
- 1.18.6. Location, alignment, design and construction of all detour, access and haul roads subject to the acceptance of the Departmental Representative.
- 1.18.7. Employ suitable measures to maintain quality, visibility, and safe conditions in the use of access, detour and haul roads associated with the Work.
- 1.18.8. Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- 1.18.9. Dust control: adequate to ensure safe operation at all times.

- 1.18.10. Provide snow removal during period of Work.
- 1.18.11. Remove, upon completion of work, haul roads designated by Departmental Representative.

1.19. Truck Wash and Decontamination Units

- 1.19.1. Provide, install and operate truck wash, including the installation of a water supply, or as directed by the Departmental Representative:
 - 1.19.1.1. No vehicles which have come in contact with Contaminated Material must leave the Site without passing through the truck wash.
 - 1.19.1.2. The truck wash must provide, at a minimum, the ability to wash truck tires and load boxes to a minimum height of 1.7 m.
 - 1.19.1.3. Truck wash must have a solid separation tank and all solids collected must be classified as Contaminated Soil and disposed of at a Disposal Facility.
 - 1.19.1.4. Recycle or treat as Contaminated Water truck wash water.
- 1.19.2. Alternatives to a truck wash, including isolating truck traffic from contact with contaminated material, may be accepted by the Departmental Representative. Alternatives will not be accepted if, in the opinion of the Departmental Representative, the alternatives are not adequately designed or performing.
- 1.19.3. Provide personnel decontamination units (minimum of 2) for use by hazardous material, testing and inspection personnel working in areas of hazardous materials and for general clean-up of personal protective equipment to remove Contaminated Material. Provide decontamination units for work force
 - 1.19.3.1. At least one personnel decontamination unit must have overhead shower capability.
 - 1.19.3.2. The personnel decontamination units to be available to Departmental Representative and their consultants.
 - 1.19.3.3. The personnel decontamination units are subject to acceptance of Departmental Representative.
- 1.19.4. The truck wash and personnel decontamination units must be maintained in good working order during onsite Work.
- 1.19.5. The truck wash and personnel decontamination units must be removed from the Site during Site Decommissioning.

1.20. Clean-Up

- 1.20.1. Remove construction debris, waste materials, packaging material from work site daily.
- 1.20.2. Clean dirt or mud tracked onto paved or surfaced roadways.
- 1.20.3. Store materials resulting from demolition activities that are salvageable.
- 1.20.4. Stack stored new or salvaged material not in construction facilities.

1.21. Storage Tanks

- 1.21.1. Abide by the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations for stored petroleum products and allied

- petroleum products tank system located on federal or Aboriginal land, or within federal jurisdiction as described in the regulations.
- 1.21.2. Temporary storage tanks subject to the regulations must be registered with Environment Canada.
 - 1.21.3. Mobile tanks subject to the regulations must be certified to be mobile.
 - 1.21.4. Storage tanks to meet the following minimum requirements:
 - 1.21.4.1. Corrosion protection.
 - 1.21.4.2. Secondary containment.
 - 1.21.4.3. Containment sumps, if applicable.
 - 1.21.4.4. Overfill protection.
 - 1.21.5. All components of tank system must bear certification marks indicating that they conform to the standards set out in the regulations.
 - 1.21.6. Product transfer area must be designed to contain spills.
 - 1.21.7. Prepare an emergency plan.
 - 1.21.8. Prior to first filling, storage tanks must:
 - 1.21.8.1. Be registered.
 - 1.21.8.2. Be certified and marked.
 - 1.21.8.3. Transfer area be constructed.
 - 1.21.8.4. Emergency plan in place.

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

CONTAMINATED SITES WATER TREATMENT ONSITE

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Contaminated Water Treatment Onsite-Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all onsite ancillary tanks, storage containers, equipment and piping to collect, store, and sample contaminated or potentially Contaminated Water. Includes provision for dewatering of Contaminated Water from excavation. Includes provision of Onsite Contaminated Water Treatment Plant.
- 1.1.2. Contaminated Water Treatment Onsite-Operation will be paid in accordance with the lump sum price established to process Contaminated Water onsite. Includes all onsite ancillary tanks, storage containers, equipment and piping to collect, store, and sample Contaminated or potentially Contaminated Water. Includes operation of dewatering of Contaminated Water from excavation. Includes treating Non-Aqueous Phase Liquids. Includes operation of Onsite Contaminated Water Treatment Plant and discharge piping. Includes analytical testing to demonstrate compliance with Contract. Lump sum may be pro-rated based on duration in Master Plan for Extension of Time.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Water Treatment Provision Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Water Treatment Plant Provision for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Includes onsite infrastructure. Must be signed by Contractor's Qualified Professional.
- 1.3.2. Provide copies of all correspondence with Discharge Approval authority, including:
 - 1.3.2.1. Copy of Discharge Approval including: approval from authority having jurisdiction, discharge criteria, and sampling requirements (including substances and other parameters, and frequency).
 - 1.3.2.2. Copy of test results forwarded to Discharge Approval authority.
 - 1.3.2.3. Copy of changes to Discharge Approval, including orders to cease discharge.
- 1.3.3. Onsite Contaminated Water Treatment Plant Testing:
 - 1.3.3.1. Within 5 Working Days of conducting initial operations testing, and prior to operating or discharge, Submit results of initial operations test.
 - 1.3.3.2. Within 5 Working Days of sampling Submit sampling results of operational (recurrent) testing.

CONTAMINATED SITES WATER TREATMENT ONSITE

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Water Transport

3.1.1. Assume ownership of, and be responsible for Contaminated Water once it enters the Onsite Contaminated Water Treatment Plant

3.2. Contaminated Water Treatment Onsite

3.2.1. Design and Discharge Requirements:

3.2.1.1. Design and Operating Criteria: design Contaminated Water Treatment Plant capable of treating Contaminated Water generated from dewatering excavations and Work areas to meet Discharge Approval requirements, capable of removing oil, suspended solids, particulates, and asbestos fibers, and filter water through 5-micron particulate filter prior to discharge.

3.2.1.2. Discharge to environment only in compliance with the Discharge Approval and requirements by the Discharge Approval authority. Discharge to environment only as determined by Contractor's Qualified Professional and as accepted by Departmental Representative.

3.2.2. Initial Testing: determine performance of Contaminated Water Treatment Plant provided by Contractor as follows prior to commencing excavation:

3.2.2.1. Test run with potable water to ensure operation, no leaks are occurring, and no contaminants are introduced into treated water.

3.2.2.2. Performance verification (contaminant removal) with Contaminated Water test batch to ensure treatment is effective. Treat, store, test, and assess samples by Contractor's Qualified Professional.

3.2.2.3. Provide access for independent collection of treated stored water samples by the Departmental Representative.

3.2.3. Operational Testing:

3.2.3.1. Operate Contaminated Water Treatment Plant using experienced, qualified personnel and in accordance with manufacturer's instructions and procedures as Submittals by Contractor.

3.2.3.2. Collect, analyze, and assess samples as required by Contractor's Qualified Professional, and at a minimum of every 72 hours of operation.

3.2.3.3. Provide access for independent collection of samples by the Departmental Representative.

CONTAMINATED SITES WATER TREATMENT ONSITE

- 3.2.3.4. On basis of analytical results by Contractor or Departmental Representative obtained from samples collected at the discharge point, cease discharge and make Plant modifications required for effluent to satisfy effluent criteria as directed by the Departmental Representative or Discharge Approval authority. Perform Initial Testing after Plant modifications.
- 3.2.4. Decommissioning/Dismantling:
 - 3.2.4.1. Decontaminate and remove salvageable components of Contaminated Water Treatment Plant including treatment system, pumps, piping, and electrical equipment.
 - 3.2.4.2. Dispose of non-salvageable equipment and materials at Disposal Facility accepted by the Departmental Representative. Decontaminate salvageable equipment as required prior to demobilization from Site.

END OF SECTION

CONTAMINATED SITES WATER TREATMENT OFFSITE

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Contaminated Water Treatment Offsite-Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all onsite ancillary tanks, storage containers, equipment and piping to collect, store, and sample contaminated or potentially Contaminated Water. Includes dewatering of Contaminated Water from excavation. Includes provision of bulk storage tanks and loading facilities for Offsite Water Treatment Facility.
- 1.1.2. Contaminated Water Treatment-Transport and Disposal will be paid in accordance with the unit rate price established for volume of water transported off-site for treatment and disposal, including Offsite Contaminated Water Treatment Facility. Includes all onsite ancillary tanks, storage containers, equipment and piping to collect, store, and sample Contaminated or potentially Contaminated Water. Includes dewatering of Contaminated Water from excavation. Includes treating, transport and disposal of Non-Aqueous Phase Liquids. Includes transport to Offsite Contaminated Water Treatment Facility. Includes analytical testing to demonstrate compliance with Contract.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Water Treatment Provision Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Water Treatment Plant Provision for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Includes onsite infrastructure.
- 1.3.2. Offsite Contaminated Water Treatment Facility Plan: at least 10 days prior to transporting material to a Treatment Facility, Submit documentation describing Treatment Facility. Include for each Treatment Facility:
 - 1.3.2.1. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Treatment of relevant Contaminated Material.
 - 1.3.2.2. Letter from Contractor's Qualified Professional that the Treatment Facility is appropriate for the nature, type, concentration, and quantity of Contaminated Material to be Treated in accordance with any authorization and complies with appropriate government requirements of a general nature (eg BC Landfill Criteria).

CONTAMINATED SITES WATER TREATMENT OFFSITE

- 1.3.2.3. Letter from Treatment Facility that they can accept within the schedule in Contract Documents the nature, type, concentration, and quantity of Contaminated Material to be Treated at the Facility, signed by an authorized representative of the Facility.
- 1.3.3. Certificate of Treatment: within 30 Working Days of treatment at Offsite Contaminated Water Treatment Facility Facility, Submit documentation verifying that materials have been treated by Contractor. Include:
 - 1.3.3.1. Issued by the Treatment Facility.
 - 1.3.3.2. On company letterhead.
 - 1.3.3.3. Name and location of facility where the material is being treated.
 - 1.3.3.4. Date and weight for each shipment received and total weight received at the offsite facility.
 - 1.3.3.5. Date and weight for each treatment event and total weight treated at the offsite facility.
 - 1.3.3.6. Treatment methodology.
 - 1.3.3.7. Laboratory certificates demonstrating Treatment objectives were met.
 - 1.3.3.8. Disposition of treated material.
 - 1.3.3.9. Signed by identified authorized treatment company representative.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Water Transport

- 3.1.1. Assume ownership of, and be responsible for Contaminated Water once it is loaded on a vehicle, barge, or other vessel for transport or once it enters the Onsite Contaminated Water Treatment Plant.

3.2. Contaminated Water Treatment Offsite

- 3.2.1. Assume ownership of, and be responsible for, Contaminated Material treated offsite.
- 3.2.2. Contaminated Material Treatment - Offsite: treat at Treatment Facility provided by Contractor and accepted by the Departmental Representative.
- 3.2.3. Offsite Treatment Facility must:
 - 3.2.3.1. Be an existing offsite facility located in Canada or the United States.
 - 3.2.3.2. Be designed, constructed and operated for the handling or processing of Contaminated Material for the purposes of Treatment.

CONTAMINATED SITES WATER TREATMENT OFFSITE

- 3.2.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the treatment of relevant Contaminated Material.
- 3.2.3.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the BC Environmental Management Act and BC Landfill Criteria for Municipal Solid Waste, or Yukon Environment Act and Yukon Solid Waste Regulations, municipal zoning bylaws, or equivalent.
- 3.2.4. Treat material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
- 3.2.5. Water sent to an offsite Treatment Facility must subsequently be discharged in compliance with a Discharge Approval.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Test Pitting will be paid in accordance with unit rate price established for time to excavate a test pit, temporarily stockpile excavated material adjacent to test pit, and backfill with excavated material using machine tamping. Measurement as recorded time by Departmental Representative.
- 1.1.2. Oversize Debris Removal will be paid in accordance with unit rate price established for time to remove oversize material from excavation. Does not include Transport or Disposal of debris. Measurement as recorded time by Departmental Representative.
- 1.1.3. Excavation will be paid in accordance with unit rate price established for volume of material removed to excavate to Contaminated Soil Extents according to Drawings. Includes surface restoration area. Includes temporary sloping and shoring design, provision, installation, removal, supervision, and inspection. Includes all onsite handling, loading, hauling, unloading and stockpiling, including hauling to Onsite Soil Treatment Facility as required. Interim Excavation volume as recorded insitu Excavation volume using Progress Survey. Final Excavation volume as recorded insitu Excavation volume using Contractor's Qualified Professional Surveyor, based on difference between Preconstruction Condition Survey and Final Excavation Limits.
 - 1.1.3.1. Excavate top 30 cm of surface restoration area as shown on Drawings and move soil to the Soil Stockpile Area within 500 m of excavation as directed by Departmental Representative. Place owner supplied geotextile prior to backfilling as directed by Departmental Representative and agreed to by Contractor's Qualified Professional.
- 1.1.4. Measurement as recorded insitu Excavation volume using Progress Survey for interim measurement and Contractor's Qualified Professional Surveyor for final excavation volume extents (As-Built). Insitu volume is simple dimensions of excavation and does not consider exsitu bulking (expansion or swell) and insitu compaction (densifying) factors.
- 1.1.5. Backfill–Imported will be paid in accordance with unit rate price established per weight for material imported for Backfill for Excavation. Includes surface restoration area. Includes Contractor's analytical testing and inspections to demonstrate compliance with Contract, provision, all onsite and offsite handling, loading, hauling, unloading, placing, grading and compacting. Measurement as recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative.
- 1.1.6. Backfill–Overburden will be paid in accordance with unit rate price established for volume of Overburden material suitable for reuse as Backfill for Excavation. Includes all onsite handling, loading, hauling, unloading and stockpiling. Measurement as recorded insitu Excavation volume using Progress Survey for

interim measurement and Contractor's Qualified Professional Surveyor for final excavation extents (As-Built). Insitu volume is simple dimensions of excavation and does not consider exsitu bulking (expansion or swell) and insitu compaction (densifying) factors.

- 1.1.7. Backfill–Owner Supplied will be paid in accordance with unit rate price established for volume of material supplied by PWGSC from sources according to Contract for Backfill for Excavation. Includes all onsite and offsite handling, loading, hauling, unloading and stockpiling. Measurement as recorded insitu Excavation volume using Progress Survey for interim measurement and Contractor's Qualified Professional Surveyor for final excavation extents (As-Built). Insitu volume is simple dimensions of excavation and does not consider exsitu bulking (expansion or swell) and insitu compaction (densifying) factors.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Excavation and Backfilling Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Excavation for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include:
- 1.3.1.1. Excavation Temporary Slope and Shoring Design must be signed and sealed by Contractor's Qualified Professional, as required by ground conditions, excavation depth, shoring type, or support type.
 - 1.3.1.2. Methods, means, and sequences for excavation dewatering and heave protection.
 - 1.3.1.3. Support of structures design.
 - 1.3.1.4. Procedures for excavations adjacent to utilities or other structures if the excavation has the potential to impact utilities or other structures.
 - 1.3.1.5. Backfilling requirements. Meet or exceed requirements in accordance with the Contract and any other codes, bylaws, rules and regulations applicable to the performance of the Work. Backfilling requirements includes Imported Backfill and Owner Supplied Backfill.
 - 1.3.1.6. Backfilling design for utilities or other infrastructure to be reinstated or new.
 - 1.3.1.7. Monitoring and inspection requirements, including frequency or milestones when Contractor's Qualified Professional must inspect Works.
 - 1.3.1.8. Excavation and Backfilling Plan must be signed and sealed by Contractor's Qualified Professional, as required by ground conditions, excavation depth, shoring type, or support type.
- 1.3.2. Import Backfill Material Quality: at least 5 Working Days prior to bringing material onsite, Submit documentation signed and sealed by Contractor's

Qualified Professional verifying that material is acceptable for import and intended use. Include:

- 1.3.2.1. Preliminary Site Investigation-Stage 1 performed by Contractor's Qualified Professional for each import source.
- 1.3.2.2. Grain-size distribution information.
- 1.3.2.3. Chemical analyses for Potential Contaminants of Concern, including benzene, toluene, ethylbenzene, xylenes, CCME petroleum hydrocarbon fractions F1 to F4, volatile petroleum hydrocarbons, and light and heavy extractable petroleum hydrocarbons, polycyclic aromatic hydrocarbons, salt parameters (i.e., soluble sodium and chloride) and metals.
- 1.3.2.4. Testing to be performed by Contractor's Qualified Professional at sufficient frequency to characterize all Imported Backfilled. Test using appropriate guidelines and practices.
- 1.3.3. Import Backfill Samples: at least 10 Working Days prior to bringing material to Site, Submit samples of Imported Backfilled.
 - 1.3.3.1. Samples to be representative of all Imported Backfilled. Sample frequency subject to acceptance by Departmental Representative.
 - 1.3.3.2. Submit sufficient sample size to allow geotechnical and environmental quality testing as directed by Departmental Representative.
- 1.3.4. Temporary Hoarding and Fencing: at least 5 Working Days prior to installation, Submit a description of temporary hoarding and fencing.
- 1.3.5. Monitoring and Testing Results: within 5 Working Days of sampling, Submit all monitoring and testing results. Include procedures, frequency of sampling, Quality Assurance and Quality Control testing and documentation to be provided. Provide monitoring and testing results, including any assessments performed by Contractor's Qualified Professional. Include:
 - 1.3.5.1. Backfill testing results, including geotechnical and environmental quality, confirming results meet requirements in Contract and Excavation Plan.
 - 1.3.5.2. Compaction testing results, confirming results meet requirements in Contract and Excavation Plan.

1.4. Sequencing for Free Phase Products

- 1.4.1. When floating free phase substance (NonAqueous Phase Liquids) is present, remove free phase from saturated soil or sediment without further contaminating soil, sediment or groundwater prior to commencing other construction Work.
- 1.4.2. Collect free phase product (NAPL), load, and transport to a Treatment Facility.

2. PART 2 - PRODUCTS

2.1. Materials

- 2.1.1. Short term temporary liners and covers to be a minimum of 4 mil plastic.

CONTAMINATED SITES EXCAVATION

- 2.1.2. Erosion and sediment control materials to meet the following minimum requirements:
 - 2.1.2.1. Hay or Straw Bale: wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale 300 mm to 450 mm into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched minimum of 100 mm into ground.
 - 2.1.2.2. Silt Fence: assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.
 - 2.1.2.3. Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.
 - 2.1.2.4. Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.
- 2.1.3. Gradations to be within limits specified when tested to ASTM C117-13 (Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing) and ASTM C136-06 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates). Sieve sizes to SCC CAN/CGSB-8.1-88 (Sieves, Testing, Woven Wire, Inch Series) and CAN/CGSB-8.2-M88 (Sieves, Testing, Woven Wire, Metric Series).
- 2.1.4. Import fill materials to meet the following minimum geotechnical requirements:
 - 2.1.4.1. For uplands material: import fill materials must be granular aggregate composed of inert, clean, tough, durable particles of crushed rock, gravel and sand capable of withstanding the deleterious effects of exposure to water, freeze-thaw, handling, spreading and compacting. The aggregate particles must be uniform in quality and free from clay lumps, wood and free from an excess of flat or elongated pieces. Imported backfill total silt and clay content not to exceed 15% by mass or as required by Contract unless otherwise accepted by Departmental Representative.
 - 2.1.4.2. For waterways work: import fill materials must be well graded mixture of clean rounded to sub-rounded gravel and sand less than 40 mm in diameter with minimal silt content (i.e., double washed to remove fine silts and sediments to <2% prior to delivery to site). Clean rounded to sub-rounded gravel and sand backfill can either be natural or premixed to gradations identified on the Drawings
- 2.1.5. Import fill materials to meet the following minimum environmental quality requirements for the site:
 - 2.1.5.1. Import fill materials must originate from a clean source, and be the lesser of the Canadian Council of Ministers of the Environment Soil Quality

CONTAMINATED SITES EXCAVATION

- Guidelines for Residential Land Uses, and the British Columbia Contaminated Sites Regulation Schedule 3.1 Urban Park (PL) for the top 3 m and CSR Schedule 3.1 Commercial (CL) below 3 m or as required by Contract unless otherwise accepted by Departmental Representative.
- 2.1.5.2. Import fill material that is cobble sized or larger (> 64mm) brought onsite must be tested by the Contractor for Acid Rock Drainage (ARD) and Metals Leaching (ML) potential using Acid Base Accounting (ABA) for assessment of ARD potential and more specifically using the Modified Sobek Test Method. The potential for metals leaching must use Shake Flask Extraction (SFE) Method for analysis of metals leaching. See guidance document *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials* MEND Report 1.20.1, Natural Resources Canada, Price 2009.
- 2.1.5.3. Any import fill material which has a discrete sample exceeding the environmental quality requirements specified must be removed from the Site and replaced, including relevant placed material, as directed by the Departmental Representative. An alternate source of backfill must be provided, with no increases to Contract Amount or Extension of Time for completion of the Work.
- 2.1.5.4. Environmental quality requirements may be modified by the Departmental Representative taking into consideration background concentrations, commercially available material, and site-specific factors and/or land use.
- 2.1.6. Import fill material additional testing:
- 2.1.6.1. Perform additional testing as directed by the Departmental Representative to confirm suitability.
- 2.1.6.2. Facilitate testing by the Departmental Representative to confirm suitability.
- 2.1.7. Asphalt, as required, must, at minimum, meet the specifications for: Upper Course #1 mix-type as specified in Section 32 12 16, Hot Mix Asphalt Concrete Paving; of the current version of the *BC Master Municipal Construction Document (2009) Platinum Edition*.

3. PART 3 - EXECUTION

3.1. Surface Preparation and Operation

- 3.1.1. Stripping of Overburden
- 3.1.1.1. Commence Overburden stripping of areas according to Drawings after stripping of Topsoil.
- 3.1.1.2. Strip Overburden to depths according to Drawings. Do not mix Overburden with other soils.
- 3.1.1.3. Stockpile Overburden as directed by Departmental Representative.
- 3.1.1.4. Segregate and stockpile Topsoil separately from other Overburden.
- 3.1.1.5. Testing of Overburden may be required if suspected of being Contaminated. Contaminated Overburden will be considered Contaminated Soil.

CONTAMINATED SITES EXCAVATION

- 3.1.1.6. Reuse Overburden as Backfill as directed by Departmental Representative and agreed to by Contractor's Qualified Professional. Dispose of unused Overburden as Non-Contaminated Quality Soil as directed by Departmental Representative.
- 3.1.1.7. Reuse suitable Topsoil as final grading surface, as accepted by Departmental Representative. Dispose of unsuitable or unused Topsoil as directed by Departmental Representative, and replace with suitable imported topsoil.
- 3.1.2. Security and Safety:
 - 3.1.2.1. Ensure Excavations are secure during onsite Work, provide, install, and remove fencing, temporary hoarding, and other security measures as required and specified.

3.2. Import Fill Material Characterization

- 3.2.1. Sample, analyse, and compare to Contract requirements all import fill material for each backfill material type and for each import source for grain-size distribution and chemical analyses for Potential Contaminants of Concern at the following frequency:
 - 3.2.1.1. Two random samples for the first 1,000 m³.
 - 3.2.1.2. One random samples for every subsequent (or portion thereof) 1,000 m³ up to 10,000 m³.
 - 3.2.1.3. One random samples for every subsequent (or portion thereof) 10,000 m³.
- 3.2.2. Sampling frequency must be increased as directed by the Departmental Representative for each of the following:
 - 3.2.2.1. If the import source does not have a Preliminary Site Investigation-Stage 1 performed by the Contractor's Qualified Professional with no Areas of Potential Environmental Concern. Sample frequency increases to at least 1 random sample for every 500 m³.
 - 3.2.2.2. If any sample collected does not meet requirements according to Contract.
- 3.2.3. Provide two random samples representative of each class and source of imported fill material samples to the Departmental Representative. Samples may be tested for geotechnical and environmental quality by Departmental Representative. Import fill material testing may take up to 5 Working Days not including day of sample provision.
- 3.2.4. Do not import fill material until Departmental Representative has completed and analysed testing. Testing and analysis will depend on parameters. Testing will be performed at industry regular (standard) turnaround times (i.e. not priority, emergency, same day or other rush turnaround times).
- 3.2.5. Departmental Representative will inspect import fill material brought onsite, and will not allow import of fill material that varies from Submittal samples.

CONTAMINATED SITES EXCAVATION

3.3. Excavation Temporary Sloping and Shoring

- 3.3.1. Design, provide, install, remove, supervise, and inspect appropriate sloping or shoring to allow excavation of Contaminated Soil Extents according to Drawings or as directed by Departmental Representative.
- 3.3.2. Departmental Representative responsible for determining Contaminated Soil Extents.
- 3.3.3. Contractor's Qualified Professional to determine Excavation Extents.
- 3.3.4. Drawings are for reference purposes only, and are Conceptual and not Issued For Construction.
- 3.3.5. Design Requirements:
 - 3.3.5.1. Design must be completed by, and is the sole responsibility of, the Contractor's Qualified Professional. All Shop Drawings of sloping and shoring design to be signed and sealed by Contractor's Qualified Professional.
 - 3.3.5.2. Act as sloping or shoring structures for excavations as well as for stability of foundations and infrastructure during remediation excavation.
 - 3.3.5.3. Allow excavation of all Contaminated Soil laterally and vertically on the Site to Contaminated Soil Extents in accordance with the Contract. Allow excavation of additional Contaminated Soil beyond Contaminated Soil Extents in order to result in no residual contamination at the Site based on field observations or Confirmation Samples.
 - 3.3.5.4. Provide a safe working environment for personnel and equipment within the excavation area, including collection of confirmatory samples or other work that may be required at the base of the excavation.
 - 3.3.5.5. Additional design requirements as determined by the Contractor's Qualified Professional.
 - 3.3.5.6. Additional sloping or shoring may be required to extend excavation beyond Contaminated Soil Extents according to Drawings. Revise Temporary Sloping and Shoring design as required by Contractor's Qualified Professional.
 - 3.3.5.7. Temporary shoring cannot have any tiebacks or supports which extend beyond the project Site boundary.
 - 3.3.5.8. Temporary shoring must not flex or bend when exposed while excavations are occurring on the Site.
 - 3.3.5.9. Sloping and shoring structures are temporary structures only. Resistance to seismic loads will be at the sole discretion of the Contractor's Qualified Professional. Be responsible for any failures and resultant costs should the temporary sloping or shoring fail due to a seismic event during the construction period.
 - 3.3.5.10. Temporary sloping and shoring designs to be completed in accordance with methods in current version of Canadian Foundation Engineering Manual.
- 3.3.6. Installation:

CONTAMINATED SITES EXCAVATION

- 3.3.6.1. Installation must be supervised by, and is the sole responsibility of, the Contractor's Qualified Professional. All inspection reports of sloping and shoring to be signed and sealed by Contractor's Qualified Professional.
- 3.3.6.2. All installation activities must take place on the Site. No staging or construction activities are to take place on adjacent properties.
- 3.3.7. Maintain side slopes of excavations in safe condition by appropriate methods and in accordance with relevant regulations.
- 3.3.8. During backfill operation:
 - 3.3.8.1. Unless otherwise identified according to Drawings or as directed by the Departmental Representative, remove temporary shoring from excavations.
- 3.3.9. Temporary sloping and shoring excavated material:
 - 3.3.9.1. Material excavated for sloping or shoring may be re-used as backfill to replace material removed as accepted by Contractor's Qualified Professional and Departmental Representative.
 - 3.3.9.2. Material excavated for sloping or shoring that is accepted for backfilling must follow procedures in accordance with requirements of Contractor's Qualified Professional and meet Contract Documents.
 - 3.3.9.3. Material excavated for sloping or shoring not accepted must be removed from Site.

3.4. Dewatering and Heave Protection

- 3.4.1. Keep excavations free of water while Work is in progress unless otherwise identified according to Drawings or as directed by the Departmental Representative.
- 3.4.2. Provide to Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- 3.4.3. Plan for excavation below groundwater table to avoid quick conditions or heave.
- 3.4.4. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- 3.4.5. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- 3.4.6. Keep excavations, staging pads, and other Work areas free from water. Provide standby equipment to ensure continuous operation of dewatering system.
- 3.4.7. Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
- 3.4.8. Separate Contaminated Water from Non-Contaminated Quality Water and collect and divert to Contaminated Water Treatment Plant as required.

3.5. Excavation

- 3.5.1. Notify Departmental Representative at least 5 Working Days in advance of excavation operations.

CONTAMINATED SITES EXCAVATION

- 3.5.2. Excavate to lines, grades, elevations and dimensions according to Drawings or as directed by Departmental Representative using methods, means, and sequences as determined by Contractor's Qualified Professional.
- 3.5.3. Excavate all Contaminated Soil laterally and vertically on the Site to Contaminated Soil Extents in accordance with the Contract. Excavate additional Contaminated Soil beyond Contaminated Soil Extents in order to result in no residual contamination at the Site based on field observations or Confirmation Samples.
- 3.5.4. Drawings show nominal Contaminated Soil Extents for volume estimating purposes only. Contractor's methods, means, and sequences should allow for variations in actual extents, contaminants, and concentrations.
- 3.5.5. Excavation must not interfere with bearing capacity of adjacent foundations and infrastructure.
- 3.5.6. Machine cut banks and slopes.
- 3.5.7. Protect bottom of excavations from excessive traffic.
- 3.5.8. Grade excavation top perimeter to prevent surface water run-off into excavation.
- 3.5.9. Keep excavated and stockpiled materials safe distance away from edge of excavation.
- 3.5.10. Restrict vehicle operations directly adjacent to open excavations.
- 3.5.11. Remove Oversize Debris.
 - 3.5.11.1. Piles encountered during excavation must be cut off at base of excavation. Piles are not to be extracted beyond the base of the excavation.
 - 3.5.11.2. Debris that impinges on infrastructure or neighbouring properties is not to be removed unless directed by Departmental Representative. Contractor's Qualified Professional to confirm debris can be removed without impacting infrastructure or neighbouring properties.
 - 3.5.11.3. Reduce size of Oversize Debris to allow to be Transported, Treated, and Disposed, as required, as Non-Contaminated Quality Soil or Contaminated Soil, as appropriate.
- 3.5.12. Remove Non-Contaminated Quality Soil to Landfill Facility or re-use as Backfill - Owner Supplied according to Contract and as directed by Departmental Representative.
- 3.5.13. Earth bottoms of excavations to be undisturbed soil or sediment, level, free from loose, soft or organic material.
- 3.5.14. Notify Departmental Representative when bottom of excavation is reached based on Contaminated Soil Extents.
- 3.5.15. Provide assistance for collection of Confirmation Samples as directed to the Departmental Representative.
- 3.5.16. Obtain acceptance by Departmental Representative of completed excavation.

3.6. Soil Stockpiling

- 3.6.1. Stockpile material within work area in locations identified by Departmental Representative.

CONTAMINATED SITES EXCAVATION

- 3.6.2. Provide, maintain, and operate temporary storage/stockpiling facilities as per Contractor's Site Layout.
- 3.6.3. Segregate Contaminated Soil from Non-Contaminated Quality Soil into separate stockpiles to prevent cross-contamination.
- 3.6.4. Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each Working Day and as directed by the Departmental Representative.
- 3.6.5. Securely fasten covers over stockpiled material until material is loaded for offsite transport.
- 3.6.6. Store excavated Non-Contaminated Quality Soil only on non-contaminated surface areas. Ensure no contact between excavated Non-Contaminated Quality Soil and drainage of Contaminated Water or Contaminated Soil.
- 3.6.7. Store excavated Contaminated Soil in temporary stockpiles.
 - 3.6.7.1. Install impermeable liner (eg asphalt or minimum 20 mil (0.5mm) polyethylene) below proposed stockpile locations to prevent contact between stockpile material and ground.
 - 3.6.7.2. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material. Cover to be impermeable (eg minimum 5 mil polyethylene) and securely fashioned to prevent blowing off.
 - 3.6.7.3. Prevent Non-Contaminated Quality Water, including surface runoff water, from coming into contact with Contaminated Soil stockpiles.
- 3.6.8. Segregate different suspect material in discrete stockpiles to facilitate ex-situ characterization for Classification as directed by the Departmental Representative.
- 3.6.9. Assist Departmental Representative in collection of stockpile samples for exsitu characterization. Ex-situ characterization may take up to 5 Working Days, not counting the day the sample is collected. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Samples results provided within 5 Working Days, not counting the day the sample is collected.
- 3.6.10. Do not remove Contaminated Soil from stockpiles until exsitu characterization completed and as directed by Departmental Representative.

3.7. Backfill Types and Compaction

- 3.7.1. Use only Imported Backfilled, Overburden Backfill, or Owner Supplied Backfill in accordance with the Contract and which has been recommended by Contractor's Qualified Professional, and previously accepted as a Submittal.
- 3.7.2. Compact material in accordance with the more stringent of Excavation Plan or Contract to ensure no long term settlement and is suitable for planned post-remediation use. Machine compact all fill materials unless otherwise according to Contract.

3.8. Backfilling

- 3.8.1. Backfill immediately only if required for stability purposes as determined by the Contractor's Qualified Professional.
- 3.8.2. Unless required to backfill immediately, do not proceed with backfilling operations until completion of following:
 - 3.8.2.1. Confirmation Samples collection, analysis, and assessment has been completed by the Departmental Representative. Confirmation Samples analysis and assessment may take up to 5 Working Days (i.e. Monday to Friday, does not include statutory holidays). No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Samples results provided within 5 Working Days, not including day of sample collection.
 - 3.8.2.2. Surveying has been completed by the Contractor's Qualified Professional for Final Excavation Limits and As-Built documents, including utilities locations.
 - 3.8.2.3. Departmental Representative has inspected and accepted Contaminated Material Extents by the Departmental Representative based on survey data and Confirmation Samples results.
 - 3.8.2.4. Departmental Representative has inspected and accepted backfill material.
 - 3.8.2.5. Imported fill material brought onsite can be sampled and tested for geotechnical and environmental quality by Departmental Representative. Backfill material testing may take up to 5 Working Days not including day of sample collection.
 - 3.8.2.6. Departmental Representative has inspected and accepted compaction results for previous lift.
 - 3.8.2.7. Removal of shoring and bracing; backfilling of voids with satisfactory backfill material.
- 3.8.3. Areas to be backfilled to be free from debris, snow, ice, water and frozen ground to greatest extent practicable.
- 3.8.4. Do not use backfill material which is frozen or contains ice, snow or debris to greatest extent practicable.
- 3.8.5. Place backfill material in uniform layers not exceeding 300 mm compacted thickness, or in accordance with the Contract. Compact each layer to the satisfaction of the Contractor's Qualified Professional and in accordance with the Contract before placing succeeding layer. If backfilling is allowed to proceed in the wet (ie underwater), use self-compacting backfill as required by Contractor's Qualified Professional in accordance with Excavation Plan.
- 3.8.6. Backfill compaction to be tested by Contractor's Qualified Professional in accordance with Excavation Plan or as directed by Departmental Representative.
- 3.8.7. Notify Departmental Representative when final backfill grade is reached.

3.9. Overburden and Owner Supplied Material Backfilling

- 3.9.1. Place in locations in excavation as directed by Departmental Representative.

CONTAMINATED SITES EXCAVATION

- 3.9.2. Be responsible for compacting to the satisfaction of Contractor's Qualified Professional and in accordance with the Contract.
- 3.9.2.1. Collect and test samples as required by Contractor's Qualified Professional prior to placement.
- 3.9.2.2. Identify any geotechnical concerns prior, and obtain Departmental Representative approval to proceed, prior to placement.

END OF SECTION

CONTAMINATED SITES SOIL TRANSPORTATION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Contaminated Soil Transport: will be paid in accordance with unit rate price established for weight of material transported. Includes all handling, stabilization/amending, loading, hauling, unloading, transfer, interim storage, and transport to and from intermediate locations and final placement location. Stabilization/amending includes all measures required to prepare material for Transport, Treatment, and Disposal; includes provision and application of stabilizers or other amendments. Measurement as recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Sites Transportation Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Transportation for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include for each Transfer/Interim Storage Facility:
- 1.3.1.1. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Transfer/Interim Storage of relevant Contaminated Material.
- 1.3.1.2. Letter from Contractor's Qualified Professional that the Transfer/Interim Storage Facility is appropriate for the nature, type, concentration, and quantity of Contaminated Material to be Transferred/Interim Stored in accordance with any authorization and complies with appropriate government requirements of a general nature (eg BC Landfill Criteria).
- 1.3.1.3. Letter from Transfer/Interim Storage Facility that they can accept within the schedule in Contract Documents the nature, type, concentration, and quantity of Contaminated Material to be Transferred/Interim Stored at the Facility, signed by an authorized representative of the Facility.
- 1.3.2. Certificate of Seaworthiness: Prior to barge shipments, Submit a Certificate of Seaworthiness by an independent licensed Marine Surveyor for all marine vessels transporting Contaminated Soil.
- 1.3.3. Transport Manifests: within 5 Working Days of offsite transport, Submit documentation verifying that material has been transported appropriately. Include:
- 1.3.3.1. Method of transport.

CONTAMINATED SITES SOIL TRANSPORTATION

- 1.3.3.2. Name of transport company.
- 1.3.3.3. Weigh scale receipt including location, date, and weight of loading, as appropriate.
- 1.3.3.4. Weigh scale receipt including location, date, and weight of unloading.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Soil Transport

- 3.1.1. Assume ownership of, and be responsible for, Contaminated Material once it is loaded on a vehicle, barge, or other vessel for transport.
- 3.1.2. Transport material as soon as practical; do not unreasonably stockpile onsite.
- 3.1.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leaching from material.
- 3.1.4. All vehicles must be watertight. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
- 3.1.5. Stabilize material for transport as necessary.
- 3.1.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Contaminated Material.
- 3.1.7. Barges must be certified by an independent Marine Surveyor for stability.
- 3.1.8. Manifest and correlate quantities of all Contaminated Material transported from Site documenting nature, type, concentration, and quantity removed from Site. Include all Transfer/Interim Storage, Treatment, and Disposal Facilities. Discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
 - 3.1.8.1. No manifest or an incomplete manifest.
 - 3.1.8.2. Material transported does not match the description in the manifest.
 - 3.1.8.3. Amount transported differs by more than 5% in the manifest.
 - 3.1.8.4. Material transported is in a hazardous condition.
- 3.1.9. Transfer/Interim Storage Facility must:
 - 3.1.9.1. Be an existing offsite facility located in Canada or the United States.
 - 3.1.9.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
 - 3.1.9.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the transfer or interim storage of relevant Contaminated Material.

CONTAMINATED SITES SOIL TRANSPORTATION

- 3.1.9.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the BC Environmental Management Act and BC Landfill Criteria for Municipal Solid Waste, or Yukon Environment Act and Yukon Solid Waste Regulations, municipal zoning bylaws, or equivalent.

END OF SECTION

CONTAMINATED SITES SOIL TREATMENT

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Contaminated Soil Treatment will be paid in accordance with unit rate price established for weight of material treated. Only includes Treatment or any other processing of material required by the Contract. Does not include Treatment or any other processing of material not required by the Contract but required by Regulations, Disposal Facility, or for other reasons. Measurement as recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative on Certificates of Treatment. Not Used.

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Contaminated Sites Treatment Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Treatment for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include for each Treatment Facility:

1.3.1.1. Letter from Contractor's Qualified Professional that the Treatment Facility is appropriate for the nature, type, concentration, and quantity of Contaminated Material to be Treated in accordance with any authorization and complies with appropriate government requirements of a general nature (eg BC Landfill Criteria).

1.3.1.2. Letter from Treatment Facility that they can accept within the schedule in Contract Documents the nature, type, concentration, and quantity of Contaminated Material to be Treated at the Facility, signed by an authorized representative of the Facility.

1.3.1.3. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Treatment of relevant Contaminated Material.

1.3.2. Certificate of Treatment: within 30 Working Days of treatment at Treatment Facility, Submit documentation verifying that materials have been treated by Contractor. Include:

1.3.2.1. Issued by the Treatment Facility.

1.3.2.2. On company letterhead.

1.3.2.3. Name and location of facility where the material is being treated.

1.3.2.4. Date and weight for each shipment received and total weight received at the offsite facility.

CONTAMINATED SITES SOIL TREATMENT

- 1.3.2.5. Date and weight for each treatment event and total weight treated at the offsite facility.
- 1.3.2.6. Treatment methodology.
- 1.3.2.7. Laboratory certificates demonstrating treatment objectives were met.
- 1.3.2.8. Disposition of treated material.
- 1.3.2.9. Signed by identified authorized treatment company representative.

2. PART 2 - PRODUCTS

2.1. Not Used

- 2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Soil Treatment

- 3.1.1. Assume ownership of, and be responsible for, Contaminated Material treated offsite.
- 3.1.2. Contaminated Material Treatment - Offsite: treat at Treatment Facility provided by Contractor and accepted by the Departmental Representative.
- 3.1.3. Offsite Treatment Facility must:
 - 3.1.3.1. Be an existing offsite facility located in Canada or the United States.
 - 3.1.3.2. Be designed, constructed and operated for the handling or processing of Contaminated Material for the purposes of Treatment.
 - 3.1.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Treatment of relevant Contaminated Material.
 - 3.1.3.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the BC Environmental Management Act and BC Landfill Criteria for Municipal Solid Waste, or Yukon Environment Act and Yukon Solid Waste Regulations, municipal zoning bylaws, or equivalent.
- 3.1.4. Treat material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
- 3.1.5. Soil sent to an offsite Treatment Facility must subsequently be Disposed of at a Disposal Facility after treatment.
- 3.1.6. If proposed Treatment Facility is not acceptable to Departmental Representative, provide an alternate Treatment Facility that is acceptable.

END OF SECTION



CONTAMINATED SITES SOIL DISPOSAL

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Contaminated Soil Disposal will be paid in accordance with unit rate price established for weight of material disposed. Includes Treatment or any other processing of material not required by the Contract but required by Regulations, Disposal Facility, or for other reasons. Measurement as recorded on weigh scale certified by Measurement Canada and results provided to Departmental Representative on Certificates of Disposal.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Sites Disposal Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Disposal for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include for each Disposal Facility:
- 1.3.1.1. Letter from Contractor's Qualified Professional that the Disposal Facility is: appropriate for the nature, type, concentration, and quantity of Contaminated Material to be Disposed in accordance with any authorization; complies with appropriate government requirements of a general nature (eg BC Landfill Criteria); and meets the Disposal Facility Minimum Criteria.
- 1.3.1.2. Letter from Disposal Facility that they can accept within the schedule in Contract Documents the nature, type, concentration, and quantity of Contaminated Material to be Disposed at the Facility, signed by an authorized representative of the Facility.
- 1.3.1.3. Copy of permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Disposal of relevant Contaminated Material.
- 1.3.2. Certificate of Disposal: within 30 Working Days of disposal at Disposal Facility, Submit documentation verifying that materials have been disposed by Contractor. Include:
- 1.3.2.1. Issued by the Disposal Facility.
- 1.3.2.2. On company letterhead.
- 1.3.2.3. Name and location of facility where the material is being disposed.
- 1.3.2.4. Date and weight for each shipment received and total weight received at the Disposal Facility.
- 1.3.2.5. Identification of acceptance of final ownership of material.
- 1.3.2.6. Signed by identified authorized disposal company representative.

CONTAMINATED SITES SOIL DISPOSAL

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Contaminated Material Disposal

- 3.1.1. Assume ownership of, and be responsible for, Contaminated Material disposed.
- 3.1.2. Contaminated Material Disposal: dispose all Contaminated Soil, including onsite or offsite treated Contaminated Material that may no longer be contaminated, at Disposal Facility provided by Contractor and accepted by the Departmental Representative.
- 3.1.3. Disposal Facility must:
 - 3.1.3.1. Be an existing offsite facility located in Canada or the United States.
 - 3.1.3.2. 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.
 - 3.1.3.3. Hold a valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the Disposal of relevant Contaminated Material.
 - 3.1.3.4. Comply with requirements of acts, regulations, bylaws, and other requirements, in force or appropriately adopted as guidelines, including the BC Environmental Management Act and BC Landfill Criteria for Municipal Solid Waste, or Yukon Environment Act and Yukon Solid Waste Regulations, municipal zoning bylaws, or equivalent.
- 3.1.4. Dispose material as soon as practical and within 100 Working Days of leaving Site or as required by Contract unless otherwise accepted by Departmental Representative.
- 3.1.5. Material sent to a Disposal Facility must be permanently stored at that facility.
- 3.1.6. If proposed Disposal Facility is not acceptable to Departmental Representative, provide an alternate Disposal Facility that is acceptable.

3.2. Disposal Facility Minimum Criteria

- 3.2.1. Designed, inspected, and monitored by a Qualified Professional.
- 3.2.2. Closure Plan prepared by a Qualified Professional.

END OF SECTION

CONTAMINATED SITES ONSITE STF CONSTRUCTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Contaminated Sites Onsite STF Construction will be paid in accordance with lump sum price established to design and construct a Soil Treatment Facility (STF). Includes design, material provision, and construction. Lump sum may be pro-rated based on surface area of Onsite Soil Treatment Facility Design to determine aggregate costs.

1.2. Definitions

- 1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

- 1.3.1. Contaminated Sites Onsite STF Construction Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Onsite STF Construction for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include:
- 1.3.1.1. Base Preparation
 - 1.3.1.2. Gradients and sump location.
 - 1.3.1.3. Granular and synthetic materials to be used.
 - 1.3.1.4. Procedures for construction.
 - 1.3.1.5. Monitoring and inspection requirements, including frequency or milestones when Contractor's Qualified Professional must inspect Works.
 - 1.3.1.6. Onsite Soil Treatment Facility Design must be signed and sealed by Contractor's Qualified Professional.

2. PART 2 - PRODUCTS

2.1. Synthetic Material

- 2.1.1. Liner material to be selected by Contractor's Qualified Professional. Liner material to meet following minimum requirements:
- 2.1.1.1. 10 year lifespan.
 - 2.1.1.2. Ultraviolet resistant.
 - 2.1.1.3. Other requirements according to Contract.

3. PART 3 - EXECUTION

CONTAMINATED SITES ONSITE STF CONSTRUCTION

3.1. Onsite STF

- 3.1.1. Construct Onsite Soil Treatment Facility in location shown on Drawings.
- 3.1.2. Site of construction to be cleared and grubbed, with no sharp protusions.

3.2. Staging Cells

- 3.2.1. Staging cells to be underlain by Liner.
- 3.2.2. Grade bottom to prevent leachate from migrating outside of Staging Cell.

3.3. Treatment Cells

- 3.3.1. Compact base material to a minimum of 100% Standard Proctor Maximum Dry Density.
- 3.3.2. Grade bottom to allow collection of water in corner.
- 3.3.3. Construct sump in corner of drainage.
- 3.3.4. Place a minimum of 0.5m of granular material above Liner to protect Liner during loading operations.
- 3.3.5. Berms to be a minimum of 1.0m high and to be wrapped in Liner. Place granular material over Liner on berms to protect from damage from loading/unloading and weather.

3.10. Onsite Access Roads

- 3.10.1. Construct, operate and maintain the onsite access roads as required.
- 3.10.2. Design of temporary onsite access roads to be signed and sealed by Contractor's Qualified Professional.
- 3.10.3. Contractor's Qualified Professional to confirm that the temporary onsite access roads allow for the safe transport of materials and equipment.
- 3.10.4. Construction of the onsite access roads may require the removal of historic infrastructure.
- 3.10.5. Any temporary access, detour and haul roads associated with the project must be constructed to accommodate all required uses and be maintained throughout the course of construction operations in a safe, environmentally sound manner.
- 3.10.6. Location, alignment, design and construction of all detour, access and haul roads subject to the acceptance of the Departmental Representative.
- 3.10.7. Employ suitable measures to maintain quality, visibility, and safe conditions in the use of access, detour and haul roads associated with the Work.

END OF SECTION

CONTAMINATED SITES ONSITE STF OPERATION

1. PART 1 - GENERAL

1.1. Measurement Procedures

- 1.1.1. Soil Turning will be paid in accordance with unit rate price established for time of excavator to access the Treatment Cells and flip the soil as directed by Department Representative. Measurement as recorded time by Departmental Representative.
- 1.1.2. Fertilizer Provision and Application will be paid in accordance with unit rate price established for weight of fertilizer supplied and applied to the Treatment Cells to assist with bioremediation. Includes all associated costs to provide, store and apply the high nitrogen water soluble fertilizer at the location identified by the Departmental Representative.
- 1.1.3. Water Application will be paid in accordance with unit rate price established for volume of water supplied and applied to the Treatment Cells to assist with bioremediation. Include all costs associated with dispersing the sump water during treatment of contaminated soil. Measurement as recorded time by Departmental Representative. Measurement as recorded volume by Departmental Representative.
- 1.1.4. Aerator Operation will be paid in accordance with unit rate price established for time of tractor or excavator to aerate soil within Treatment Cells to depth and degree as directed by Departmental Representative. Includes removal of Debris. Measurement as recorded time by Departmental Representative.
- 1.1.5. Bioremediated Soil Relocation will be paid in accordance with unit rate price established for volume of soil moved from the Treatment Cells to the Bioremediated Soil Staging Cells. Also includes movement of bioremediated soil from Bioremediated Soil Staging Cells back to Treatment Cells as directed by Departmental Representative. Includes grading and sediment control measures at the Staging Cells. Measurement as recorded exsitu volume using Progress Survey.
- 1.1.6. Soil Sampling Assistance will be paid in accordance with unit rate price established for time of backhoe or excavator to access the Bioremediated Soil Staging Cells to excavate soil sampling locations as directed by Department Representative. Measurement as recorded time by Departmental Representative.
- 1.1.7. Compliant Soil Relocation will be paid in accordance with unit rate price established for volume of soil moved from the Bioremediated Soil Staging Cells to the Compliant Soil Stockpile Area, within 500 m as directed by the Departmental Representative. Includes grading and sediment control measures at the storage area. Measurement as recorded exsitu volume using Progress Survey.

CONTAMINATED SITES ONSITE STF OPERATION

1.2. Definitions

1.2.1. See 01 11 55.

1.3. Action and Informational Submittals

1.3.1. Contaminated Sites Onsite STF Operation Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit methods, means, and sequences for Contaminated Sites Onsite STF Operation for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include:

1.3.1.1. Repair material.

1.3.1.2. Procedures for repair.

1.3.1.3. Monitoring and inspection requirements.

2. PART 2 - PRODUCTS

2.1. Fertilizer

2.1.1. Fertilizer to have N:P:K ratio of 10:1:1 or higher for Nitrogen (eg 30:3:3 or 40:4:4). Fertilizer to be in weatherproof container suitable for unprotected storage onsite for at least 1 year, as accepted by Departmental Representative.

2.2. Equipment

2.2.1. Aerator to be one or more tractor and/ or excavator:

2.2.1.1. Tractor to be four wheel drive or track mounted with cultivator (including disks or tines, or combination) as appropriate for site conditions to complete Work within Schedule.

2.2.1.2. Excavator to be a tracked excavator with a suitable attachment (including allu bucket, mixer, tiller, auger, screener, raker, or combination) as appropriate for site conditions to complete Work within Schedule.

3. PART 3 - EXECUTION

3.1. Soil Treatment Onsite

3.1.1. Remove debris from the Treatment Cells. Debris is Non-Contaminated Quality Waste that will interfere with tilling of soil within the Land Treatment Facility at a Landfill. Debris includes: rocks, concrete, brick, metal, wood.

3.1.2. Turn soil in the Treatment Cells using an excavator as directed by Department Representative. Bucket of the excavator must be marked and it must not come in contact with the geotextile separator marker layer. The anticipated depth of the soil to be turned is less than 2 m.

CONTAMINATED SITES ONSITE STF OPERATION

- 3.1.3. Provide and apply fertilizer to soils in Treatment Cells as directed by Department Representative. This includes all associated costs to transport and store the nitrate fertilizer at the location specified by the Departmental Representative.
- 3.1.4. Provide and apply water (as needed) to soils in Treatment Cells as required based on field observations at application rates and methodology as accepted by Departmental Representative.
- 3.1.5. Aerate the upper 400 mm of the contaminated soil within to soils in Treatment Cells with Aerator based on field observations by Departmental Representative. This process will be repeated for additional lifts as the upper layer is deemed bioremediated by the Departmental Representative.
- 3.1.6. Move bioremediated soil from to soils in Treatment Cells to the Bioremediated Soil Staging Cells adjacent the Treatment Cells. Bioremediated soil to be windrowed as directed by the Departmental Representative to allow exsitu sampling by the Departmental Representative. Fertilizer may be applied as directed by the Departmental Representative.
- 3.1.7. Facilitate soil confirmation sampling in the Bioremediated Soil Staging Cells using a backhoe or excavator as directed by Department Representative. Departmental Representative responsible for confirmation sample collection, analysis and assessment.
- 3.1.8. Once confirmation sample has been collected by the Department Representative it may take up to 10 Working Days (i.e. Monday to Friday, does not include statutory holidays) to complete analysis and assessment. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Sampling results provided within 10 Working Days (i.e. Monday to Friday, does not include statutory holidays), not including day of sample collection.
- 3.1.9. Once the bioremediated soil is confirmed compliant by the Departmental Representative, move compliant soil to the Compliant Soil Stockpile Area within 500 m of the Bioremediated Soil Staging Cells. The compliant soil in the storage area will be required to be stockpiled as directed by the Departmental Representative. Fertilizer may be applied as directed by the Departmental Representative. Move non-compliant soil back into to soils in Treatment Cells for additional bioremediation as directed by Departmental Representative.
- 3.1.10. Trucks are only to operate on Onsite Soil Treatment Facility when there is a minimum of 1m of soil present.
- 3.1.11. Tracked equipment is only to operate on Onsite Soil Treatment Facility when there is a minimum of 0.5m of soil present

3.2. Onsite Soil Treatment Facility Closure

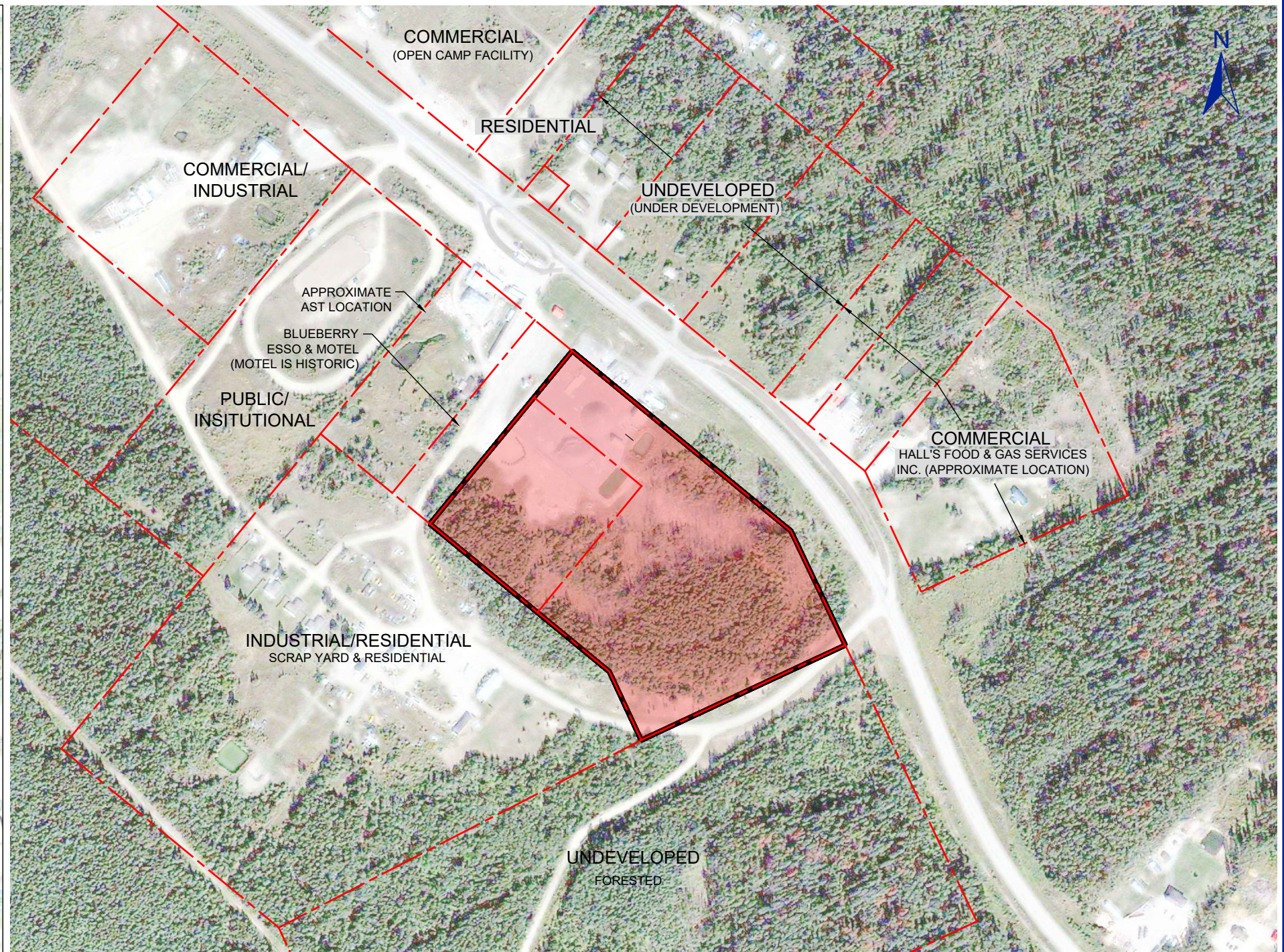
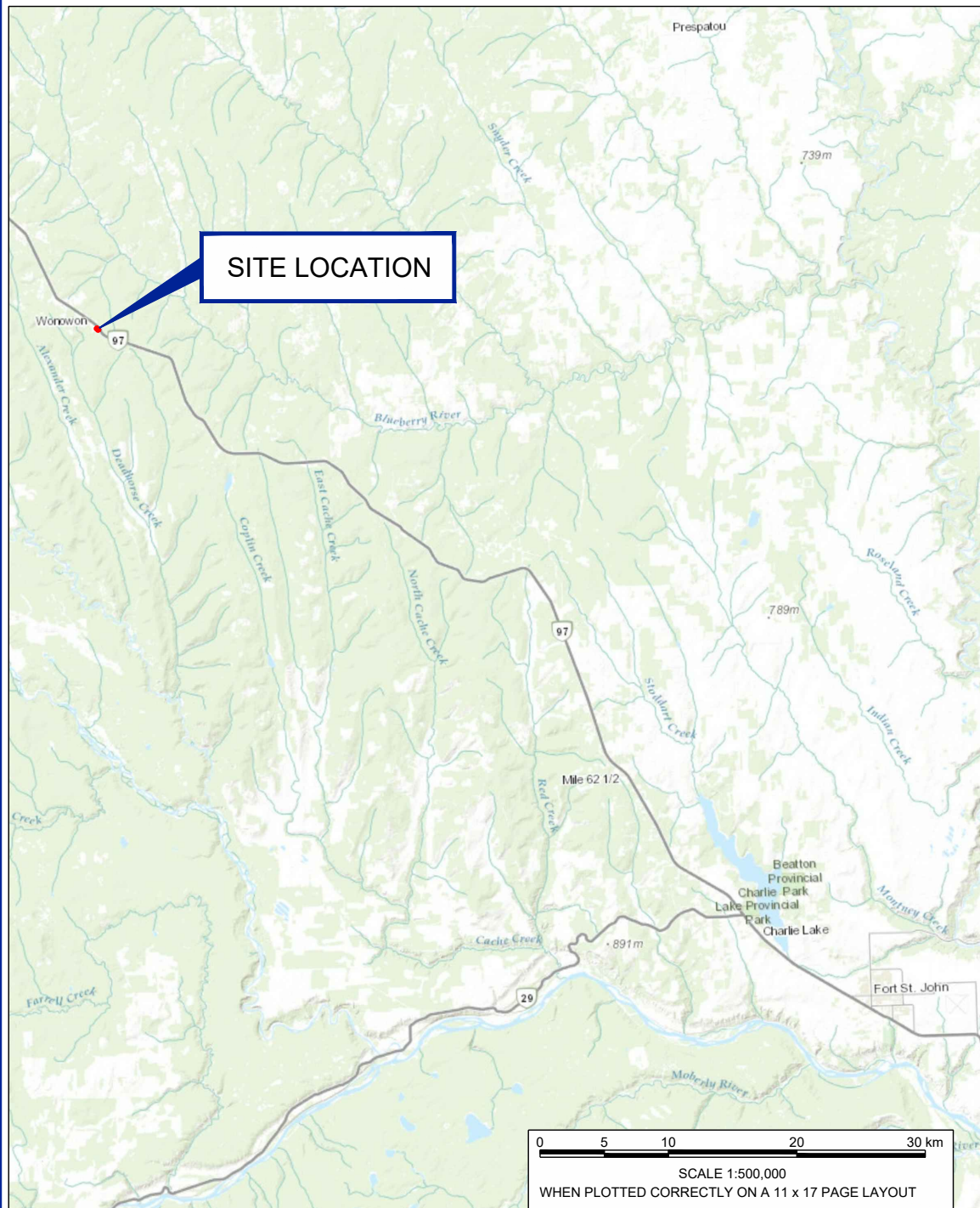
- 3.2.1. At completion of transport and placement of material to Onsite Soil Treatment Facility:
 - 3.2.1.1. Grade soil for drainage to prevent ponding within soil treatment facility.

CONTAMINATED SITES ONSITE STF OPERATION

- 3.2.1.2. Cover soil and secure cover with hold downs after grading soil for drainage. Provide and install cover and hold downs. Hold downs to be selected by Contractor's Qualified Professional and accepted by Departmental Representative and not damage cover. Cover material to be selected by Contractor's Qualified Professional and accepted by Departmental Representative. Cover material to meet following minimum requirements:
 - 3.2.1.2.1. 25 mil reinforced polyethylene
 - 3.2.1.2.2. 10 year lifespan.
 - 3.2.1.2.3. Ultraviolet resistant.
 - 3.2.1.2.4. Other requirements according to Contract.

END OF SECTION

Drawing No.	Drawing Title
Wonowon Maintenance Camp	
1	Site Location
2	Site Plan
3	Proposed Excavation Areas
4	Site Restoration



Caddfile name: N:\Vancouver\CAD\Project Drawings\2016\206_03963\206_03963\20000\S_206-03963-20000-A2.dwg



NOTES:
REFERENCED FROM: PEACE RIVER REGIONAL DISTRICT ONLINE MAPPING APPLICATION, SNC LAVALIN DRAWING (NO. 626907-002) AND SITE RECONNAISSANCE INFORMATION.

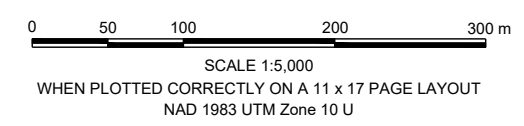
LEGAL DESCRIPTION:
DL 1713, INCLUDING BLOCK A & B PEACE RIVER DISTRICT
KM 320 HIGHWAY 97, BC

BASEDATA:
Topo map: HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, swisstopo © OpenStreetMap, Esri wms, accessed August 2016.

LEGEND:

--- PROPERTY BOUNDARY

█ SITE LOCATION



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

PUBLIC SERVICES AND PROCUREMENT CANADA
WONOWON MAINTENANCE CAMP
HIGHWAY 97
WONOWON, BC

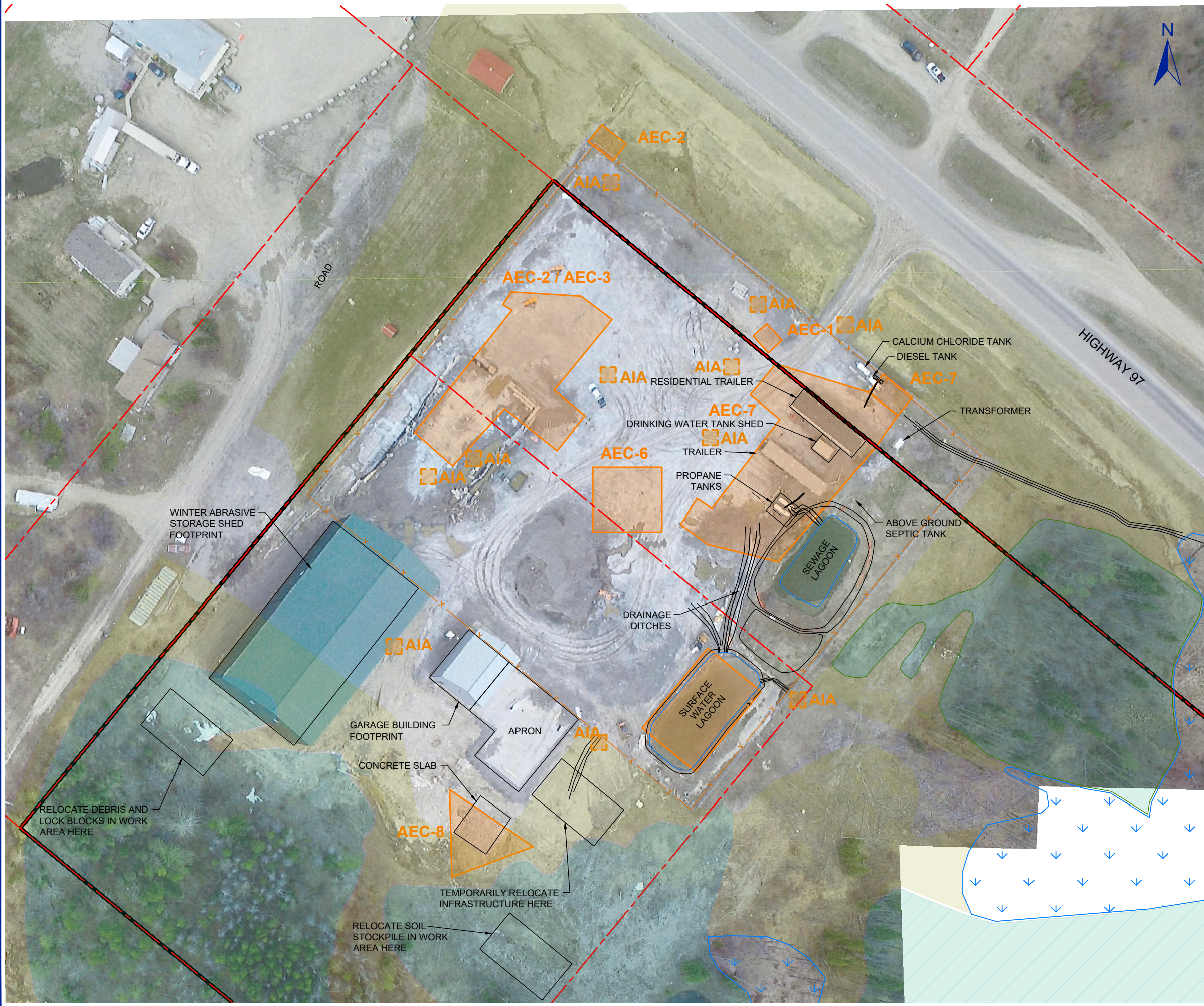
TENDER SPECIFICATION FOR REMEDIATION
OF CONTAMINATED SOIL AND SOIL
TREATMENT FACILITY OPERATION

SITE LOCATION - WONOWON MAINTENANCE CAMP

Date: June 19, 2020	Drawing No. 1
Project No. 219.03963.20000	



Cadfile name: N:\Vancouver\CAD\Project Drawings\2016\206.03963\206.03963\20000\A2.dwg



NOTES:
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 REFERENCED FROM: PEACE RIVER REGIONAL DISTRICT ONLINE MAPPING APPLICATION, SNC LAVALIN DRAWING (NO. 626907-002) AND SITE RECONNAISSANCE INFORMATION. IMAGERY © 2017 DIGITALGLOBE (IMAGE DATE: JUNE 2016)

LEGAL DESCRIPTION:
 DL 1713, INCLUDING BLOCK A & B PEACE RIVER DISTRICT
 KM 320 HIGHWAY 97, BC

- LEGEND:
- PROPERTY BOUNDARY
 - SITE
 - FENCE - BARBED WIRE
 - SITE INFRASTRUCTURE
 - FORESTED
 - CLEARED/VEGETATED
 - WETLAND
 - AREA OF ENVIRONMENTAL CONCERN (AEC)
 - ADDITIONAL IMPACTED AREAS (AIA)



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

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

PUBLIC SERVICES AND PROCUREMENT CANADA
 WONOWON MAINTENANCE CAMP
 HIGHWAY 97
 WONOWON, BC

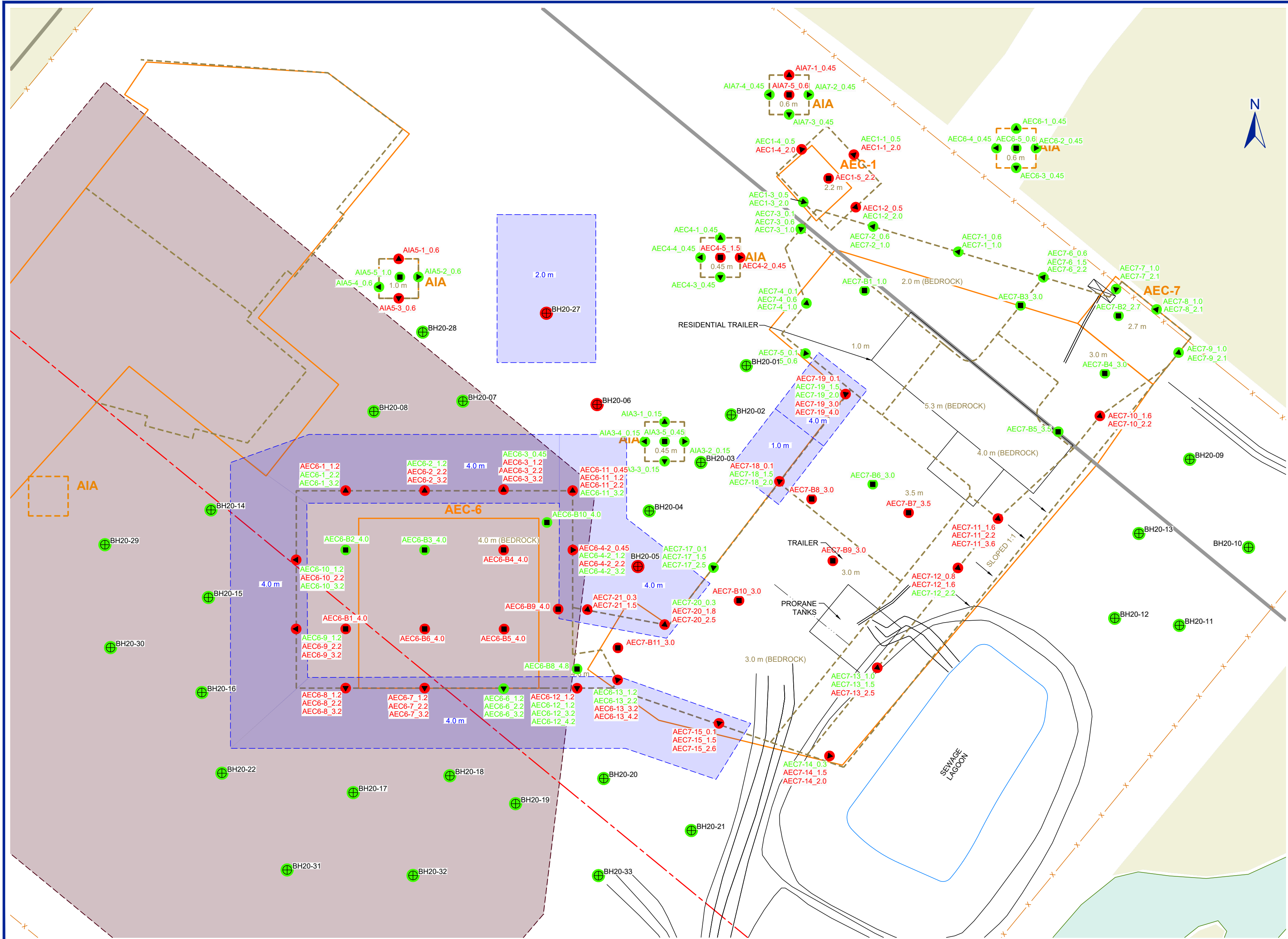
TENDER SPECIFICATION FOR REMEDIATION OF
 CONTAMINATED SOIL AND SOIL TREATMENT
 FACILITY OPERATION

SITE PLAN

Date: June 19, 2020	Drawing No. 2
Project No. 219.03963.20000	



Cadfile name: N:\Vancouver\CAD\Project Drawings\2016\2016.03963\2016.03963.20000\S_206-03963-20000-A2.dwg



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LEGAL DESCRIPTION:
 DL 1713, INCLUDING BLOCK A & B PEACE RIVER DISTRICT KM 320 HIGHWAY 97, BC

LEGEND:

- PROPERTY BOUNDARY
- SITE
- FENCE - BARBED WIRE
- SITE INFRASTRUCTURE
- FORESTED
- CLEARED/VEGETATED
- WETLAND
- AREA OF ENVIRONMENTAL CONCERN (AEC)
- ADDITIONAL IMPACTED AREAS (AIA)
- PROPOSED 2020 EXCAVATION AREA DEPTH IN METERS BELOW GROUND SURFACE
- SURFACE RESTORATION AREA
- LIMITS OF EXCAVATION (2019)
- DEPTH OF EXCAVATION (m) (2019)
- SOIL SAMPLE, EXCAVATION BASE
- SOIL SAMPLE, EXCAVATION WALL
- SOIL SAMPLE DEPTH (m)
- BOREHOLE
- UTILITIES AND SYMBOLS
- U/G PRODUCT LINE
- SOIL LABORATORY ANALYSIS RESULTS
- CONCENTRATIONS LESS THAN OR EQUAL TO APPLICABLE STANDARDS
- CONCENTRATION(S) GREATER THAN APPLICABLE STANDARD(S)

BRITISH COLUMBIA
 2314
 Aaron Hassele
 1976-2020
 P.Ag.
INSTITUTE OF AGROLOGISTS

0 2.5 5 10 15 m
 SCALE 1:300
 WHEN PLOTTED CORRECTLY ON A 14 x 22 PAGE LAYOUT
 NAD 1983 UTM Zone 10 U

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PUBLIC SERVICES AND PROCUREMENT CANADA
WONOWON MAINTENANCE CAMP
 HIGHWAY 97
 WONOWON, BC

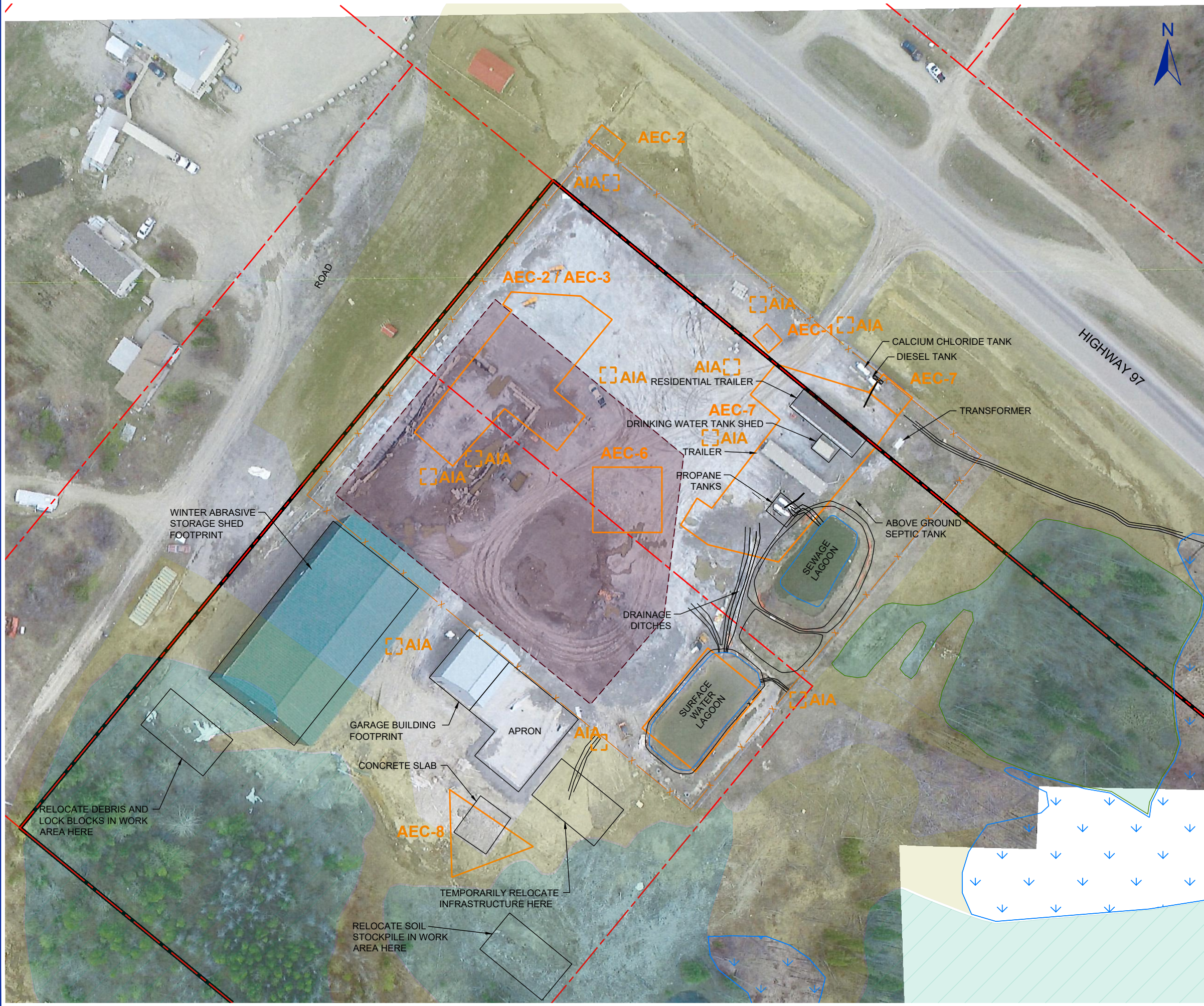
TENDER SPECIFICATION FOR REMEDIATION OF CONTAMINATED SOIL AND SOIL TREATMENT FACILITY OPERATION

PROPOSED EXCAVATION AREAS

Date: June 19, 2020	Drawing No.
Project No. 219.03963.20000	3

SLR

Cadfile name: N:\Vancouver\CAD\Project Drawings\2016\206_03963\206_03963\20000\A2.dwg



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 - WETLAND
 - AREA OF ENVIRONMENTAL CONCERN (AEC)
 - ADDITIONAL IMPACTED AREAS (AIA)
 - SURFACE RESTORATION AREA



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

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PUBLIC SERVICES AND PROCUREMENT CANADA
WONOWON MAINTENANCE CAMP
HIGHWAY 97
WONOWON, BC

TENDER SPECIFICATION FOR REMEDIATION OF
CONTAMINATED SOIL AND SOIL TREATMENT
FACILITY OPERATION

SITE RESTORATION

Date: June 19, 2020	Drawing No. 4
Project No. 219.03963.20000	



Annex No.

A

Annex Title

Wonowon - Site Photographs



Photograph 1: Overview of the site looking southwest (June 2020).



Photograph 2: Overview of the site looking west (June 2020).



Photograph 3: View of the site 2020 excavation area, looking southwest (June 2020).



Photograph 4: View of the site 2020 excavation area, looking southwest (June 2020).



Photograph 5: View of eastern corner of the site, east of the trailers, looking southwest (June 2020).



Photograph 6: View of eastern corner of the site and sewage lagoon, looking southwest (June 2020).



Photograph 7: View of surface restoration area, looking northeast (June 2020).



Photograph 8: View of surface restoration area, looking southeast (June 2020).



Photograph 9: Aerial view of site, looking west (May 2019).



Photograph 10: Aerial view of site (May 2019).

Annex No.

B

Annex Title

Wonowon - Environmental Data

TABLE 1: SOIL - CONFIRMATORY SAMPLES - PHYSICAL PARAMETERS & PETROLEUM HYDROCARBONS

	Petroleum Hydrocarbons															
	benzene	toluene	ethylbenzene	total xylenes	styrene	VH6-10	VPHs	EPHs10-19	LEPHs	EPHs19-32	HEPHs	F1 (C6-C10 less BTEX)	F1 (C6-C10)	F2 (C10-C16)	F3 (C16-C34)	F4 (C34-C50)
	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
Reported Detection Limit	0.005	0.05	0.01	0.05	0.05	10	10	20	20	20	20	10	10	20	20	20
BC CSR CL h	ns	ns	ns	ns	50000	ns	200	2000 ^{#1}	2000	5000 ^{#1}	5000	ns	ns	ns	ns	ns
BC CSR CL e	ns	ns	ns	ns	50	ns	200	2000 ^{#1}	2000	5000 ^{#1}	5000	ns	ns	ns	ns	ns
BC CSR CL dw	0.035	6	15	6.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR CL fw	2.5	0.5	200	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR CL i	1000	20000	25000	50000	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR CL t	250	450	650	600	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR RLld h	ns	ns	ns	ns	8500	ns	200	1000 ^{#1}	1000	1000 ^{#1}	1000	ns	ns	ns	ns	ns
BC CSR RLld e	ns	ns	ns	ns	5	ns	200	1000 ^{#1}	1000	1000 ^{#1}	1000	ns	ns	ns	ns	ns
BC CSR RLld dw	0.035	6	15	6.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR RLld fw	2.5	0.5	200	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR RLld i	150	3500	4000	8500	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
BC CSR RLld t	100	150	200	150	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Site Area	Sample Location	Sample Depth (mbg)	Sample Date	Sample ID	benzene	toluene	ethylbenzene	total xylenes	styrene	VH6-10	VPHs	EPHs10-19	LEPHs	EPHs19-32	HEPHs	F1 (C6-C10 less BTEX)	F1 (C6-C10)	F2 (C10-C16)	F3 (C16-C34)	F4 (C34-C50)		
AEC 6	AEC6-1	1.2	2019-Sep-18	AEC6-1_1.2	0.011	0.14	0.08	0.25	<0.05	<10	<10	61	61	666	666	<10	<10	<20	898	400		
		2.2		AEC6-1_2.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
		3.2		AEC6-1_3.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
	AEC6-2	1.2	2019-Sep-18	AEC6-2_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
		2.2		AEC6-2_2.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	45	45	<20	<20	<20	<10	<10	48	<20	<20	<20
		3.2		AEC6-2_3.2	<0.005	<0.05	0.01	<0.05	<0.05	23	23	256	256	<20	<20	23	23	232	<20	<20	<20	<20
	AEC6-3	0.45	2019-Sep-18	AEC6-3_0.45	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
		1.2		AEC6-3_1.2	0.017	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
		2.2		AEC6-3_2.2	0.059	<0.05	0.14	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20
	AEC6-3.2	3.2	AEC6-3_3.2	0.091	<0.05	0.46	<0.05	<0.05	17	17	504	504	<20	<20	17	18	448	62	<20	<20	<20	
		0.45	2019-Sep-21	AEC6-4-2_0.45	0.02	0.1	0.13	0.78	<0.05	<10	<10	29	29	30	30	<10	<10	24	<20	<20	<20	<20
		1.2		AEC6-4-2_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
	2.2	AEC6-4-2_2.2		0.005	<0.05	0.04	<0.05	<0.05	43	43	1170	1170	32	32	42	42	1130	153	<20	<20		
	AEC6-4-2	3.2	AEC6-4-2_3.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
		1.2	2019-Sep-18	AEC6-7_1.2	0.023	1.29	2.33	30.5	<0.05	238	204	58	58	<20	<20	207	242	48	<20	<20	<20	
		2.2		AEC6-7_2.2	0.097	0.12	0.73	1.33	<0.05	115	113	2750	2750	124	124	114	116	2200	470	<20	<20	
	3.2	AEC6-DUP4		0.106	0.09	0.59	0.97	<0.05	128	126	3990	3990	183	183	133	135	3870	833	<20	<20		
	AEC6-7	1.2	2019-Sep-18	AEC6-7_3.2	<0.005	<0.05	0.02	<0.05	<0.05	<10	<10	518	518	32	32	<10	<10	399	114	<20	<20	
		2.2		AEC6-8_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	11	11	10,400	10,400	574	574	11	11	8300	2130	<20	<20	
		3.2		AEC6-8_3.2	0.035	<0.05	0.08	0.08	<0.05	<10	<10	279	279	<20	<20	<10	<10	228	33	<20	<20	
	AEC6-8	1.2	2019-Sep-18	AEC6-8_2.2	0.012	<0.05	0.44	1.58	<0.05	106	104	2340	2340	110	110	105	107	2080	453	<20	<20	
		2.2		AEC6-9_1.2	<0.005	<0.05	0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
		3.2		AEC6-9_3.2	0.007	<0.05	0.29	0.76	<0.05	45	44	4620	4620	205	205	44	45	3480	784	<20	<20	
	AEC6-9	1.2	2019-Sep-18	AEC6-10_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
		2.2		AEC6-10_2.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	1050	1050	53	53	<10	<10	803	222	<20	<20	
		3.2		AEC6-10_3.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
	AEC6-10	0.45	2019-Sep-18	AEC6-11_0.45	0.31	1.99	0.22	1.83	<0.05	19	15	26	26	86	86	15	19	<20	73	20	<20	
		1.2		AEC6-11_1.2	0.016	<0.05	0.02	<0.05	<0.05	<10	<10	27	27	102	102	<10	<10	<20	102	<20	<20	
		2.2		AEC6-11_2.2	0.017	<0.05	0.05	<0.05	<0.05	20	20	132	132	69	69	20	20	113	60	<20	<20	
	AEC6-11	3.2	AEC6-11_3.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	97	97	<20	<20	<10	<10	88	<20	<20	<20		
		1.2	2019-Sep-22	AEC6-12_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20	
		2.2		AEC6-12_2.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20	
	3.2	AEC6-12_3.2		<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20		
	AEC6-12	4.2	AEC6-12_4.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20		
		1.2	2019-Sep-22	AEC6-13_1.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20	
		2.2		AEC6-13_2.2	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	<20	<20	<20	<20	
	3.2	AEC6-13_3.2		<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	-	-	-	-	<10	<10	469	79	117	<20		
	AEC6-13	4.2	AEC6-13_4.2	<0.005	<0.05	0.01	<0.05	<0.05	15	15	-	-	-	-	16	16	318	65	124	<20		
		0.1	2019-Sep-22	AEC7-15_0.1	0.005	<0.05	0.01	<0.05	<0.05	<10	<10	454	454	78	78	<10	<10	449	194	24	<20	
		1.5		AEC7-15_1.5	<0.005	<0.05	0.23	<0.05	<0.05	<10	<10	780	780	97	97	<10	<10	823	297	60	<20	
	2.6	AEC7-15_2.6		<0.005	<0.05	1.44	1.3	<0.05	245	242	8970	8970	593	593	250	252	9300	2690	61	<20		
	AEC7-18	0.1	2019-Sep-21	AEC7-18_0.1	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	57	57	351	351	<10	<10	<20	409	100	<20	
		1.5		AEC7-18_1.5	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
		2.5		AEC7-18_2.5	<0.005	<0.05	<0.01	<0.05	<0.05	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20	<20	
	AEC7-19	0.1	2019-Sep-21	AEC7-19_0.1	<0.005	0.12	<0.01	<0.05	<0.05	<10	<10	21	21	153	153	<10	<10	<20	158	41	<20	

TABLE 2: SOIL - CONFIRMATORY SAMPLES - POLYCYCLIC AROMATIC HYDROCARBONS

		PAHs																				
		acenaphthylene	acenaphthene	anthracene	benz(a)anthracene	benzo(b)fluoranthene	benzo(b,f)fluoranthene	benzo(g,h,i)perylene	benzo(j)fluoranthene	benzo(k)fluoranthene	benzo(a)pyrene	chrysene	dibenz(a,h)anthracene	fluoranthene	fluorene	indeno(1,2,3-cd)pyrene	methylnaphthalene, 1-	methylnaphthalene, 2-	naphthalene	phenanthrene	pyrene	quinoline
Reported Detection Limit		µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
BC CSR CL h		ns	15000	ns	300	ns	300	ns	ns	300	ns	4500	30	ns	9500	300	1000	950	ns	10000	7500	10
BC CSR CL e		ns	ns	ns	10	ns	10	ns	ns	10	ns	ns	10	ns	ns	ns	ns	ns	50	100	ns	ns
BC CSR CL dw		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	100	ns	ns	ns
BC CSR CL fw		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	75	ns	ns	ns
BC CSR CL i		ns	ns	75000	ns	ns	ns	ns	ns	30	ns	ns	10000	ns	ns	ns	ns	5000	ns	ns	ns	ns
BC CSR CL t		ns	ns	30	ns	ns	ns	ns	ns	70	ns	ns	200	ns	ns	ns	ns	20	ns	ns	ns	ns
BC CSR RLId h		ns	950	ns	50	ns	50	ns	ns	50	ns	200	5	ns	600	50	250	60	ns	1500	1000	2.5
BC CSR RLId e		ns	ns	ns	1	ns	1	ns	ns	1	ns	ns	1	ns	ns	1	ns	ns	ns	5	10	ns
BC CSR RLId dw		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	100	ns	ns	ns
BC CSR RLId fw		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	75	ns	ns	ns
BC CSR RLId i		ns	ns	10000	ns	ns	ns	ns	ns	ns	5	ns	ns	1500	ns	ns	ns	ns	850	ns	ns	ns
BC CSR RLId t		ns	ns	2.5	ns	ns	ns	ns	ns	20	ns	ns	50	ns	ns	ns	ns	0.6	ns	ns	ns	ns

Site Area	Sample Location	Sample Depth (mbg)	Sample Date	Sample ID	acenaphthylene	acenaphthene	anthracene	benz(a)anthracene	benzo(b)fluoranthene	benzo(b,f)fluoranthene	benzo(g,h,i)perylene	benzo(j)fluoranthene	benzo(k)fluoranthene	benzo(a)pyrene	chrysene	dibenz(a,h)anthracene	fluoranthene	fluorene	indeno(1,2,3-cd)pyrene	methylnaphthalene, 1-	methylnaphthalene, 2-	naphthalene	phenanthrene	pyrene	quinoline		
AEC 6	AEC6-1	1.2	2019-Sep-18	AEC6-1_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.043	0.101	0.02	<0.02	<0.01	<0.05		
		2.2		AEC6-1_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
		3.2		AEC6-1_3.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	0.012	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
	AEC6-2	1.2	2019-Sep-18	AEC6-2_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
		2.2		AEC6-2_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.02	<0.02	0.093	0.21	0.049	<0.02	<0.01	<0.05		
		3.2		AEC6-2_3.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.09	<0.02	0.124	<0.005	0.083	0.02	<0.01	<0.05		
	AEC6-3	0.45	2019-Sep-18	AEC6-3_0.45	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
		1.2		AEC6-3_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
		2.2		AEC6-3_2.2	<0.005	<0.005	<0.004	<0.03	0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	0.006	<0.01	<0.02	<0.02	0.041	0.042	0.166	<0.02	<0.01	<0.05		
	AEC6-4-2	0.45	2019-Sep-21	AEC6-4-2_0.45	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.083	0.121	0.092	<0.02	<0.01	<0.05		
		1.2		AEC6-4-2_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.008	0.012	0.013	<0.02	<0.01	<0.05		
		2.2		AEC6-4-2_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.45	<0.02	1.02	0.542	0.568	0.18	<0.01	<0.05		
	AEC6-7	1.2	2019-Sep-18	AEC6-7_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.033	0.082	0.163	<0.02	<0.01	<0.05		
		2.2		AEC6-7_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.51	<0.02	9.78	9.15	3.22	0.62	<0.01	<0.05		
		3.2		AEC6-DUP4	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	1.21	<0.02	13.1	11	4.1	0.98	<0.01	<0.05		
	AEC6-8	1.2	2019-Sep-18	AEC6-8_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.07	<0.02	1.21	1.68	0.775	0.09	<0.01	<0.05
		2.2		AEC6-8_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.47	<0.02	10.1	14.3	5.9	0.58	<0.01	<0.05		
		3.2		AEC6-8_3.2	<0.005	<0.005	<0.004	<0.03	0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.07	<0.02	1.21	1.68	0.775	0.09	<0.01	<0.05		
	AEC6-9	1.2	2019-Sep-18	AEC6-9_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.006	0.009	<0.005	<0.02	<0.01	<0.05		
		2.2		AEC6-9_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	0.01	0.93	<0.02	18.9	29.8	11.6	1.13	0.01	<0.05		
		3.2		AEC6-9_3.2	<0.005	<0.005	<0.004	<0.03	0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.09	<0.02	1.16	0.93	1.1	0.11	<0.01	<0.05		
	AEC6-10	1.2	2019-Sep-18	AEC6-10_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.006	0.009	<0.005	<0.02	<0.01	<0.05		
		2.2		AEC6-10_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.08	<0.02	0.982	1.48	0.429	0.03	<0.01	<0.05		
		3.2		AEC6-10_3.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05		
	AEC6-11	0.45	2019-Sep-21	AEC6-11_0.45	<0.005	<0.005	<0.004	<0.03	0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	0.02	<0.02	<0.02	0.143	0.214	0.099	0.11	0.02	<0.05		
		1.2		AEC6-11_1.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.063	0.076	0.013	<0.02	<0.01	<0.05		
		2.2		AEC6-11_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.05	<0.02	1.08	2.22	0.537	<0.02	<0.01	<0.05		
AEC6-12	1.2	2019-Sep-22	AEC6-12_1.2	<0.005	0.02	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	0.02	<0.02	<0.005	0.024	<0.005	<0.02	<0.01	<0.05			
	2.2		AEC6-12_2.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05			
	3.2		AEC6-12_3.2	<0.005	<0.005	<0.004	<0.03	<0.02	<0.05	<0.05	<0.02	<0.02	<0.03														

**TABLE 3: SOIL - INVESTIGATION SAMPLES
PETROLEUM HYDROCARBONS**

	Petroleum Hydrocarbons														
	benzene	toluene	ethylbenzene	total xylenes	VHs6-10	VPHs	EPHs10-19	LEPHs	EPHs19-32	HEPHs	F1 (C6-C10 less BTEX)	F1 (C6-C10)	F2 (C10-C16)	F3 (C16-C34)	F4 (C34-C50)
	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
Reported Detection Limit	0.005	0.05	0.01	0.05	10	10	20	20	20	20	10	10	20	20	20
BC CSR CL h	ns	ns	ns	ns	ns	200	2000 ^{#1}	2000	5000 ^{#1}	5000	ns	ns	ns	ns	ns
BC CSR CL e	ns	ns	ns	ns	ns	200	2000 ^{#1}	2000	5000 ^{#1}	5000	ns	ns	ns	ns	ns
BC CSR CL dw	0.035	6	15	6.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR CL fw	2.5	0.5	200	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR CL i	1000	20000	25000	50000	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR CL t	250	450	650	600	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR RLId h	ns	ns	ns	ns	ns	200	1000 ^{#1}	1000	1000 ^{#1}	1000	ns	ns	ns	ns	ns
BC CSR RLId e	ns	ns	ns	ns	ns	200	1000 ^{#1}	1000	1000 ^{#1}	1000	ns	ns	ns	ns	ns
BC CSR RLId dw	0.035	6	15	6.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR RLId fw	2.5	0.5	200	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR RLId i	150	3500	4000	8500	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
BC CSR RLId t	100	150	200	150	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	

Location	Sample Depth (mbg)	Sample Date	Sample ID	benzene	toluene	ethylbenzene	total xylenes	VHs6-10	VPHs	EPHs10-19	LEPHs	EPHs19-32	HEPHs	F1 (C6-C10 less BTEX)	F1 (C6-C10)	F2 (C10-C16)	F3 (C16-C34)	F4 (C34-C50)
BH20-05	0.2 - 0.5	2020-Jun-10	BH20-05_0.15-0.5	<0.005	<0.05	<0.01	<0.05	<10	<10	<20	<20	69	69	<10	<10	<20	74	28
	1.1 - 1.4		BH20-05_1.1-1.4	<0.005	<0.05	0.02	0.1	<10	<10	<20	<20	<20	<20	<10	<10	<20	<20	<20
	1.8 - 2.1	2020-Jun-10	BH20-05_1.8-2.1	0.007	<0.05	0.06	<0.05	<10	<10	310	310	<20	<20	<10	<10	220	41	<20
	2.4 - 2.7		DUP1	0.006	<0.05	0.06	<0.05	<10	<10	321	321	<20	<20	<10	<10	228	40	<20
BH20-27	0.3 - 0.6	2020-Jun-12	BH20-27_0.3-0.6	<0.005	<0.05	<0.01	<0.05	-	-	30	30	122	122	<10	<10	<20	133	<20
	1.2 - 1.5		BH20-27_1.2-1.5	<0.005	<0.05	<0.01	<0.05	-	-	482	481	693	691	<10	<10	253	818	452
	2.1 - 2.4		BH20-27_2.1-2.4	<0.005	<0.05	<0.01	<0.05	-	-	<20	<20	<20	<20	<10	<10	<20	<20	<20
	3.0 - 3.4		BH20-27_3.0-3.4	<0.005	<0.05	<0.01	<0.05	-	-	<20	<20	<20	<20	<10	<10	<20	<20	<20

Standards / Guidelines Descriptions:

- BC CSR CL h:BC Contaminated Sites Regulation, Schedule 3.1 Part 2 Generic Numerical Soil Standards to Protect Human Health, Commercial
- BC CSR CL e:BC Contaminated Sites Regulation, Schedule 3.1 Part 3 Generic Numerical Soil Standards to Protect Ecological Health, Commercial
- BC CSR CL dw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater used for drinking water - Commercial
- BC CSR CL fw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater flow to surface water used by aquatic life (Freshwater) - Commercial
- BC CSR CL i:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Intake of Contaminated Soil - Commercial
- BC CSR CL t:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Toxicity to soil invertebrates and plants - Commercial
- BC CSR RLId h:BC Contaminated Sites Regulation, Schedule 3.1 Part 2 Generic Numerical Soil Standards to Protect Human Health, Residential (Low Density)
- BC CSR RLId e:BC Contaminated Sites Regulation, Schedule 3.1 Part 3 Generic Numerical Soil Standards to Protect Ecological Health, Residential (Low Density)
- BC CSR RLId dw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater used for drinking water - Residential (Low Density)
- BC CSR RLId fw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater flow to surface water used by aquatic life (Freshwater) - Residential (Low Density)
- BC CSR RLId i:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Intake of Contaminated Soil - Residential (Low Density)
- BC CSR RLId t:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Toxicity to soil invertebrates and plants - Residential (Low Density)

Standards / Guidelines Comments:

#1:for screening purposes where PAH not analyzed

Notes:

- mbg - metres below grade
- < - less than reported detection limit
- '-' - sample not analyzed for parameter indicated
- ns - no standard
- where many exceedance formats are used, highlighted results reflect the least stringent standard/guideline exceeded
- samples collected from the same location, date and depth interval are blind field duplicate / parent sample pairs
- laboratory analytical reports detail detection limits, testing protocols and QA/QC procedures
- µg/g - micrograms per gram
- LEPHs - Light Extractable Petroleum Hydrocarbons in soil: EPHs10-19 minus PAH compounds: naphthalene and phenanthrene
- EPHs19-32 - heavy extractable petroleum hydrocarbons (nC₁₉-nC₃₂)
- HEPHs - EPHs19-32 minus PAH compounds: benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene and pyrene
- VH6-10 - volatile petroleum hydrocarbons (nC₆-nC₁₀)
- VPHs - VHC6-C10 minus BTEX and styrene

TABLE 4: SOIL - INVESTIGATION SAMPLES - POLYCYCLIC AROMATIC HYDROCARBONS

	PAHs																				
	acenaphthylene	acenaphthene	anthracene	benz(a)anthracene	benzo(b)fluoranthene	benzo(b+g)fluoranthenes	benzo(g,h,i)perylene	benzo(j)fluoranthene	benzo(k)fluoranthene	benzo(a)pyrene	chrysene	dibenz(a,h)anthracene	fluoranthene	fluorene	indeno(1,2,3-cd)pyrene	methylnaphthalene, 1-	methylnaphthalene, 2-	naphthalene	phenanthrene	pyrene	quinoline
Reported Detection Limit	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
BC CSR CL h	ns	15000	ns	300	ns	300	ns	ns	300	ns	4500	30	ns	9500	300	1000	950	ns	10000	7500	10
BC CSR CL e	ns	ns	ns	10	ns	10	ns	ns	10	ns	ns	10	ns	ns	10	ns	ns	ns	50	100	ns
BC CSR CL dw	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	100	ns	ns	ns
BC CSR CL fw	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	75	ns	ns	ns
BC CSR CL i	ns	ns	75000	ns	ns	ns	ns	ns	ns	30	ns	ns	10000	ns	ns	ns	ns	5000	ns	ns	ns
BC CSR CL t	ns	ns	30	ns	ns	ns	ns	ns	ns	70	ns	ns	200	ns	ns	ns	ns	20	ns	ns	ns
BC CSR RLld h	ns	950	ns	50	ns	50	ns	ns	50	ns	200	5	ns	600	50	250	60	ns	1500	1000	2.5
BC CSR RLld e	ns	ns	ns	1	ns	1	ns	ns	1	ns	ns	1	ns	ns	1	ns	ns	ns	5	10	ns
BC CSR RLld dw	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	100	ns	ns	ns
BC CSR RLld fw	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	75	ns	ns	ns
BC CSR RLld i	ns	ns	10000	ns	ns	ns	ns	ns	ns	5	ns	ns	1500	ns	ns	ns	ns	850	ns	ns	ns
BC CSR RLld t	ns	ns	2.5	ns	ns	ns	ns	ns	ns	20	ns	ns	50	ns	ns	ns	ns	0.6	ns	ns	ns

Location	Sample Depth (mbg)	Sample Date	Sample ID	PAHs																				
				acenaphthylene	acenaphthene	anthracene	benz(a)anthracene	benzo(b)fluoranthene	benzo(b+g)fluoranthenes	benzo(g,h,i)perylene	benzo(j)fluoranthene	benzo(k)fluoranthene	benzo(a)pyrene	chrysene	dibenz(a,h)anthracene	fluoranthene	fluorene	indeno(1,2,3-cd)pyrene	methylnaphthalene, 1-	methylnaphthalene, 2-	naphthalene	phenanthrene	pyrene	quinoline
BH20-05	0.2 - 0.5	2020-Jun-10	BH20-05_0.15-0.5	<0.005	<0.005	<0.004	<0.03	<0.02	<0.03	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	0.007	0.011	<0.005	<0.02	<0.01	<0.05	
	1.1 - 1.4		BH20-05_1.1-1.4	<0.005	<0.005	<0.004	<0.03	<0.02	<0.03	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	0.005	<0.02	<0.01	<0.05
	1.8 - 2.1	2020-Jun-10	BH20-05_1.8-2.1	<0.005	<0.005	<0.004	<0.03	0.06	0.06	<0.05	<0.02	<0.02	<0.03	<0.05	0.012	<0.01	0.09	<0.02	0.587	0.516	0.161	0.03	<0.01	<0.05
	DUP1		<0.005	<0.005	<0.004	<0.03	0.07	0.07	<0.05	<0.02	<0.02	<0.03	<0.05	0.014	<0.01	0.11	<0.02	0.772	0.683	0.216	0.03	<0.01	<0.05	
2.4 - 2.7	2020-Jun-10	BH20-05_2.4-2.7	<0.005	<0.005	<0.004	<0.03	<0.02	<0.03	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.068	0.073	0.015	<0.02	<0.01	<0.05	
BH20-27	0.3 - 0.6	2020-Jun-12	BH20-27_0.3-0.6	<0.005	<0.005	<0.004	<0.03	<0.02	<0.03	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	0.008	0.01	<0.005	<0.02	0.01	<0.05
	1.2 - 1.5		BH20-27_1.2-1.5	<0.005	<0.005	0.231	0.37	0.17	0.26	0.14	0.09	0.1	0.26	0.49	0.058	0.42	0.12	0.12	0.206	0.259	0.085	0.9	0.72	<0.05
	2.1 - 2.4		BH20-27_2.1-2.4	<0.005	<0.005	0.004	<0.03	<0.02	<0.03	<0.05	<0.02	<0.02	<0.03	<0.05	<0.005	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05
	3.0 - 3.4		BH20-27_3.0-3.4	<0.005	<0.005	<0.004	<0.03	0.07	0.07	0.05	<0.02	0.02	<0.03	<0.05	0.021	<0.01	<0.02	<0.02	<0.005	<0.005	<0.005	<0.02	<0.01	<0.05

Standards / Guidelines Descriptions:

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- BC CSR CL dw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater used for drinking water - Commercial
- BC CSR CL fw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater flow to surface water used by aquatic life (Freshwater) - Commercial
- BC CSR CL i:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Intake of Contaminated Soil - Commercial
- BC CSR CL t:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Toxicity to soil invertebrates and plants - Commercial
- BC CSR RLld h:BC Contaminated Sites Regulation, Schedule 3.1 Part 2 Generic Numerical Soil Standards to Protect Human Health, Residential (Low Density)
- BC CSR RLld e:BC Contaminated Sites Regulation, Schedule 3.1 Part 3 Generic Numerical Soil Standards to Protect Ecological Health, Residential (Low Density)
- BC CSR RLld dw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater used for drinking water - Residential (Low Density)
- BC CSR RLld fw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater flow to surface water used by aquatic life (Freshwater) - Residential (Low Density)
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Notes:

- mbg - metres below grade
- < - less than reported detection limit
- '-' - sample not analyzed for parameter indicated
- formatting of cells indicates exceedances of like-formatted standards
- ns - no standard
- samples collected from the same location, date and depth interval are blind field duplicate / parent sample pairs
- laboratory analytical reports detail detection limits, testing protocols and QA/QC procedures
- µg/g - micrograms per gram
- PAH - polycyclic aromatic hydrocarbons

TABLE 5: SOIL - INVESTIGATION SAMPLES - METALS

	Metals																														
	pH (lab)	aluminum	antimony	arsenic	barium	beryllium	bismuth	cadmium	calcium	chromium (III+VI)	cobalt	copper	iron	lead	lithium	magnesium	manganese	mercury	molybdenum	nickel	potassium	silver	sodium	strontium	thallium	tin	titanium	uranium	vanadium	zinc	
	pH Units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	
Reported Detection Limit	0.1	10	0.1	0.1	0.5	0.1	0.5	0.01	10	1	0.1	0.2	10	0.1	0.5	10	1	0.01	0.2	0.5	5	0.5	5	1	0.1	0.2	1	0.2	1	1	
BC CSR CL h	ns	250000	1500	ns	ns	ns	ns	ns	ns	ns	ns	ns	150000	ns	450	ns	ns	ns	ns	ns	ns	1500	ns	150000	ns	150000	ns	ns	ns	ns	ns
BC CSR CL e	ns	ns	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	40	ns	ns	25	300	ns	ns	ns	ns	ns	ns
BC CSR CL dw	ns	ns	ns	10	350	1 - 2500 *	ns	1 - 70 *	ns	60	25	250 - 100000 *	ns	120 - 8500 *	ns	ns	2000	ns	15	70 - 500 *	ns	ns	ns	ns	ns	ns	ns	30	100	200 - 5500 *	
BC CSR CL fw	ns	ns	ns	10	3500	1 - 500 *	ns	1 - 50 *	ns	60	25	75 - 7500 *	ns	200 ^{#1} - 90000 ^{#1} *	ns	ns	ns	ns	650	90 - 9500 *	ns	ns	ns	ns	ns	ns	ns	150	ns	150 - 3000 *	
BC CSR CL i	ns	ns	ns	150	50000	500	ns	150	ns	750	75	25000	ns	150	ns	ns	35000	75	1500	3000	ns	ns	ns	ns	ns	ns	ns	750	1500	75000	
BC CSR CL t	ns	ns	ns	40	1500	350	ns	75	ns	250	200	300	ns	1000	ns	ns	2000	75	150	250	ns	ns	ns	ns	ns	ns	ns	2000	300	450	
BC CSR RLId h	ns	40000	250	ns	ns	ns	ns	ns	ns	ns	ns	ns	35000	ns	30	ns	ns	ns	ns	ns	200	ns	9500	ns	25000	ns	ns	ns	ns	ns	
BC CSR RLId e	ns	ns	20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	20	ns	ns	9	50	ns	ns	ns	ns	ns	
BC CSR RLId dw	ns	ns	ns	10	350	1 - 2500 *	ns	1 - 70 *	ns	60	25	250 - 100000 *	ns	120 - 8500 *	ns	ns	2000	ns	15	70 - 500 *	ns	ns	ns	ns	ns	ns	ns	30	100	200 - 5500 *	
BC CSR RLId fw	ns	ns	ns	10	3500	1 - 500 *	ns	1 - 50 *	ns	60	25	75 - 7500 *	ns	200 ^{#1} - 90000 ^{#1} *	ns	ns	ns	ns	650	90 - 9500 *	ns	ns	ns	ns	ns	ns	ns	150	ns	150 - 3000 *	
BC CSR RLId i	ns	ns	ns	20	8500	85	ns	20	ns	100	25	3500	ns	120	ns	ns	6000	10	200	450	ns	ns	ns	ns	ns	ns	ns	100	200	10000	
BC CSR RLId t	ns	ns	ns	25	700	150	ns	30	ns	200	45	150	ns	550	ns	ns	2000	40	80	150	ns	ns	ns	ns	ns	ns	ns	500	150	450	
BC P4 Background Soil - Region 7 Omineca/Peace	ns	40000	4 ^{#2}	10	500	1	ns	0.4 ^{#2}	ns	50 ^{#3}	25	70	40000	25	ns	ns	1500	0.09 ^{#4}	3	60	ns	1 ^{#2}	ns	70	ns	4 ^{#2}	ns	ns	95	150	

Location	Sample Depth (mbg)	Sample Date	Sample ID	pH	aluminum	antimony	arsenic	barium	beryllium	bismuth	cadmium	calcium	chromium (III+VI)	cobalt	copper	iron	lead	lithium	magnesium	manganese	mercury	molybdenum	nickel	potassium	silver	sodium	strontium	thallium	tin	titanium	uranium	vanadium	zinc
BH20-05	1.8 - 2.1	2020-Jun-10	BH20-05_1.8-2.1	7.2	21,800	1.5	9.4	737	1.1	<0.5	1.33	7970	41	19.2	50.9	50,200	21.2	17.6	6560	498	0.07	7.4	60.9	2820	<0.5	1900	73	0.2	0.9	142	1.7	64	171
			DUP1	7.2	21,400	1.5	12.5	702	1.1	<0.5	1.32	7840	41	19.7	50	47,700	20.4	17.1	6450	539	0.07	7.2	61.1	2750	<0.5	1840	66	0.2	0.8	124	1.7	64	168
	2.4 - 2.7	2020-Jun-10	BH20-05_2.4-2.7	7.2	23,600	0.7	6.6	315	1	<0.5	1.22	5590	42	15.8	51.4	39,700	16.9	18.5	7050	491	0.05	0.9	53.7	2650	<0.5	1270	61	0.3	0.9	108	1.9	60	163

Standard/Guideline Descriptions

- BC CSR CL h:BC Contaminated Sites Regulation, Schedule 3.1 Part 2 Generic Numerical Soil Standards to Protect Human Health, Commercial
- BC CSR CL e:BC Contaminated Sites Regulation, Schedule 3.1 Part 3 Generic Numerical Soil Standards to Protect Ecological Health, Commercial
- BC CSR CL dw:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Groundwater used for drinking water - Commercial
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- BC CSR RLId t:BC Contaminated Sites Regulation, Schedule 3.1 Part 1 Numerical Soil Standards, Toxicity to soil invertebrates and plants - Residential (Low Density)
- BC P4 Background Soil - Region 7 Omineca/Peace:BC CSR Protocol 4 Table 1: Regional estimates for background concentrations in soil for inorganic substances (Region 7 Omineca/Peace)

Standard/Guideline Comments

- #1:Standard varies with receiving water hardness (H). H = 200 to < 300 mg/L as CaCO3 is assumed.
- #2:Regional estimate is one-half the mean detection limit
- #3:Chromium = total chromium
- #4:Mercury = inorganic mercury

* BC CSR pH-Dependent Standards

Notes:	Be - DW	Cd - DW	Cu - DW	Pb - DW	Ni - DW	Zn - DW
mbg - metres below grade	1 @ pH < 5.5	1 @ pH < 7.0	250 @ pH < 5.0	120 @ pH < 5.5	70 @ pH < 7.5	200 @ pH < 5.0
< - less than reported detection limit	1.5 @ pH 5.5<6.0	4.5 @ pH 7.0<7.5	500 @ pH 5.0<5.5	150 @ pH 5.5<6.0	250 @ pH 7.5<8.0	250 @ pH 5.0<5.5
'-' - sample not analyzed for parameter indicated	4 @ pH 6.0<6.5	30 @ pH 7.5<8.0	2,000 @ pH 5.5<6.0	800 @ pH 6.0<6.5	500 @ pH ≥ 8.0	300 @ pH 5.5<6.0
• formatting of cells indicates exceedances of like-formatted standards	20 @ pH 6.5<7.0	70 @ pH ≥ 8.0	10,000 @ pH 6.0<6.5	3,500 @ pH 6.5<7.0		450 @ pH 6.0<6.5
• where many exceedance formats are used, highlighted results reflect the least stringent standard/guideline exceeded	150 @ pH 7.0<7.5		50,000 @ pH 6.5<7.0	7,500 @ pH 7.0<7.5		600 @ pH 6.5<7.0
• samples collected from the same location, date and depth interval are blind field duplicate / parent sample pairs	1,000 @ pH 7.5<8.0		100,000 @ pH ≥ 7.0	8,500 @ pH ≥ 7.5		1,000 @ pH 7.0<7.5
• laboratory analytical reports detail detection limits, testing protocols and QA/QC procedures	2,500 @ pH ≥ 8.0					3,000 @ pH 7.5<8.0
µg/g - micrograms per gram						5,500 @ pH ≥ 8.0
ns - no standard						
* - range of pH-dependent standards; value is compared to standard derived from pH of individual sample						
• metals with pH-dependent standards:						
• Be - beryllium, Cd - cadmium, Cu - copper, Pb - lead, Ni = nickel, Zn - zinc						
• water uses:						

Annex No.

C

Annex Title

Sikanni - FY 2020/2021 Soil Treatment Facility Data and
Proposed Sequencing of Operations and Drawings

SLR Consulting (Canada) Ltd.
1586 Ogilvie Street
Prince George, BC V2N 1W9

Tel: 250-562-4452
Fax: 250-562-4458



Memorandum

To: Amy Moizumi **From:** Jonathon Risinger, P.Geo.
Aaron Haegele, P.Ag., P.Chem.

Company: Public Services and Procurement Canada

cc: **Date:** June 19, 2020

Subject: **FY 2020/2021 SOIL TREATMENT DATA AND PROPOSED SEQUENCING OF OPERATIONS**

SLR Consulting (Canada) Ltd. (SLR) is pleased to provide the following Soil Treatment Facility (STF) data summary and proposed sequencing of tilling operations for treatment of soil at the Sikanni Maintenance Camp (SMC) located along the Alaska Highway at Km 254, approximately 183 km north of Fort St. John, BC.

1.0 DATA SUMMARY

1.1 Soil Treatment Facility Details

Two STFs were constructed at SMC to accommodate contaminated soil that was excavated during the FY 2017/2018 remedial program. Details of these STFs, including the inside dimensions in metres (m), current approximate volume in cubic metres (m³) and the estimated number of lifts to treat, are summarized in Table 1. For planning purposes, each lift has been assumed to be approximately 400 millimetres (mm) thick, but may vary depending on equipment used, variability in cell thickness, and other factors. The location plan and STF Drawings are included within the specification Annex D.

Table 1: Summary of STF Details

Maintenance Camp	STF Location	STF Inside Dimensions (Approximate L x W)	Current Approximate STF Volume (m ³)	Estimated No. of Lifts (400 mm) to Treat
SMC (Km 254)	Sikanni Chief (Km 254)	STF #1 = 100 m x 40 m STF #2 = 55 m x 45 m	STF #1 = 8,200 STF #2 = 5,990	STF #1 = 5 lifts STF #2 = 6 lifts

1.2 Contaminants of Concern

The primary contaminants of concern (COCs) are petroleum hydrocarbons, which include, but are not limited to benzene, toluene, ethylbenzene and xylenes (BTEX), volatile petroleum hydrocarbons (VPHs), petroleum hydrocarbon (PHC) fractions F1-F4, light and heavy extractable petroleum hydrocarbons (LEPH/HEPH, respectively), methyl tert-butyl ether (MTBE) and polycyclic aromatic hydrocarbons (PAHs).

The secondary COCs that are being sampled for the purposes of characterization, but not being remediated within this scope of work, include metals, road salts (i.e., sodium and chloride) and total Kjeldahl nitrogen.

2.0 PROPOSED SEQUENCING OF TREATMENT OPERATIONS

The proposed sequencing of treatment operations at SMC are detailed below. The application of high-nitrogen fertilizer may occur prior to the soil tilling of each lift to best facilitate mixing into the soil and bioremediation during the tilling/aeration process. The application of fertilizer will be at the discretion of the Department Representative (i.e., Consultant).

The final stockpile location for soil deemed appropriate to be removed from the STF as directed by the Department Representative will be at the discretion of the Owner. For purposes of planning, the stockpile location is expected to be within 500 m of the STF from which the soil originated.

2.1 Sikanni Maintenance Camp

The proposed sequence of operations at SMC is as follows:

- Contractor to till the first lift at STF #1 while adding fertilizer and water at the discretion of the Department Representative. Once tilling has been completed, the Departmental Representative to conduct an insitu soil sampling program with the assistance of the Contractor and submit the samples for laboratory analysis;
- Contractor to move to STF #2 and till the first lift while adding fertilizer and water at the discretion of the Department Representative. Once tilling has been completed, the Departmental Representative to conduct an insitu soil sampling program with the assistance of the Contractor and submit the samples for laboratory analysis;
- Contractor to move back to STF #1. It is anticipated that the analytical results will be available for review by the Department Representative. If the soil meets the remedial objectives, the Department Representative will approve the removal of the soil from the STF. Contractor to load the approved soils into trucks and transport to the final stockpile location as designated by the Department Representative.
 - If the analytical results do not meet the remedial objectives, Contractor to continue tilling the existing lift. Once completed, the Departmental Representative to resample the soil with assistance from the Contractor and submit the samples for laboratory analysis and repeat process;
- Contractor to begin tilling the next lift at STF #1 while adding fertilizer and water at the discretion of the Department Representative. Once tilling has been completed, the Departmental Representative to conduct an insitu soil sampling program with the assistance of the Contractor and submit the samples for laboratory analysis;

- Contractor to move to STF #2 and continue to repeat the process above as time permits or until all remaining soil in STF #1 and STF #2 meet the remedial objectives and is transported to the final stockpile location;
- As required, the Contractor to purge excess water from the STF sump and temporarily store onsite. Contractor to load the water onto a leak-free truck designed to carry water and dispose of the water at an offsite permitted facility.
- The Contractor to provide new covers and hold downs and secure cover in place with hold downs onto STF #1 and STF #2.

SIKANNI CHIEF BIOCELL AS-BUILT DRAWING INDEX

COVER & INDEX

COVER	SHEET 1 OF 9	COVER PAGE
ID-001	SHEET 2 OF 9	SHEET INDEX & KEY PLAN

BIOCELL #1 & #2 AS-BUILT DRAWINGS

EG-001	SHEET 3 OF 9	ORIGINAL GROUND
FG-001	SHEET 4 OF 9	AS-BUILT BIOCELL #1 & #2
CS-001	SHEET 5 OF 9	BIOCELL #1 - CROSS SECTION & VOLUME
CS-002	SHEET 6 OF 9	BIOCELL #2 - CROSS SECTION & VOLUME



B LOCATION PLAN
SCALE NTS

LEGEND:

NOTES:

1) THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND REPRESENTS AS-BUILT SURVEY DATA THAT WAS COLLECTED BETWEEN OCTOBER AND NOVEMBER OF THE YEAR 2016 AS WELL AS DATA COLLECTED BETWEEN OCTOBER AND NOVEMBER OF THE YEAR 2017. SITE ENERGY SERVICES WILL NOT BE HELD ACCOUNTABLE FOR ANY DIFFERENCE BETWEEN THE DATA SHOWN AND ANY DATA COLLECTED BEFORE OR AFTER THE DATES OUTLINED ABOVE.

2) ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED

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△3				
△2				
△1				

No.	DESCRIPTION	DATE	BY	APP'D
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CONSULTANT:



APPROVED FOR	BY	DATE
-	-	-
AS-BUILT	JMZ	01/11/2017
COORDINATE SYSTEM	UTM NAD83 - ZONE 10 NORTH	
GEOID MODEL	CANADA GEOID MODEL HT2_0	

SCALE: NTS

	BY	DATE
SURVEYED	WSP & RAYMAC	VARIES
DRAWN	JMZ	01/11/2017
CHECKED	JMZ	01/11/2017



**Public Works and
Government Services
Canada**

PROJECT:

CONTRACT FOR THE REMEDIATION OF
SIKANNI CHIEF BIOCELL
IN THE PROVINCE OF BRITISH COLUMBIA

SHEET TITLE:

SIKANNI CHIEF BIOCELL REMEDIATION

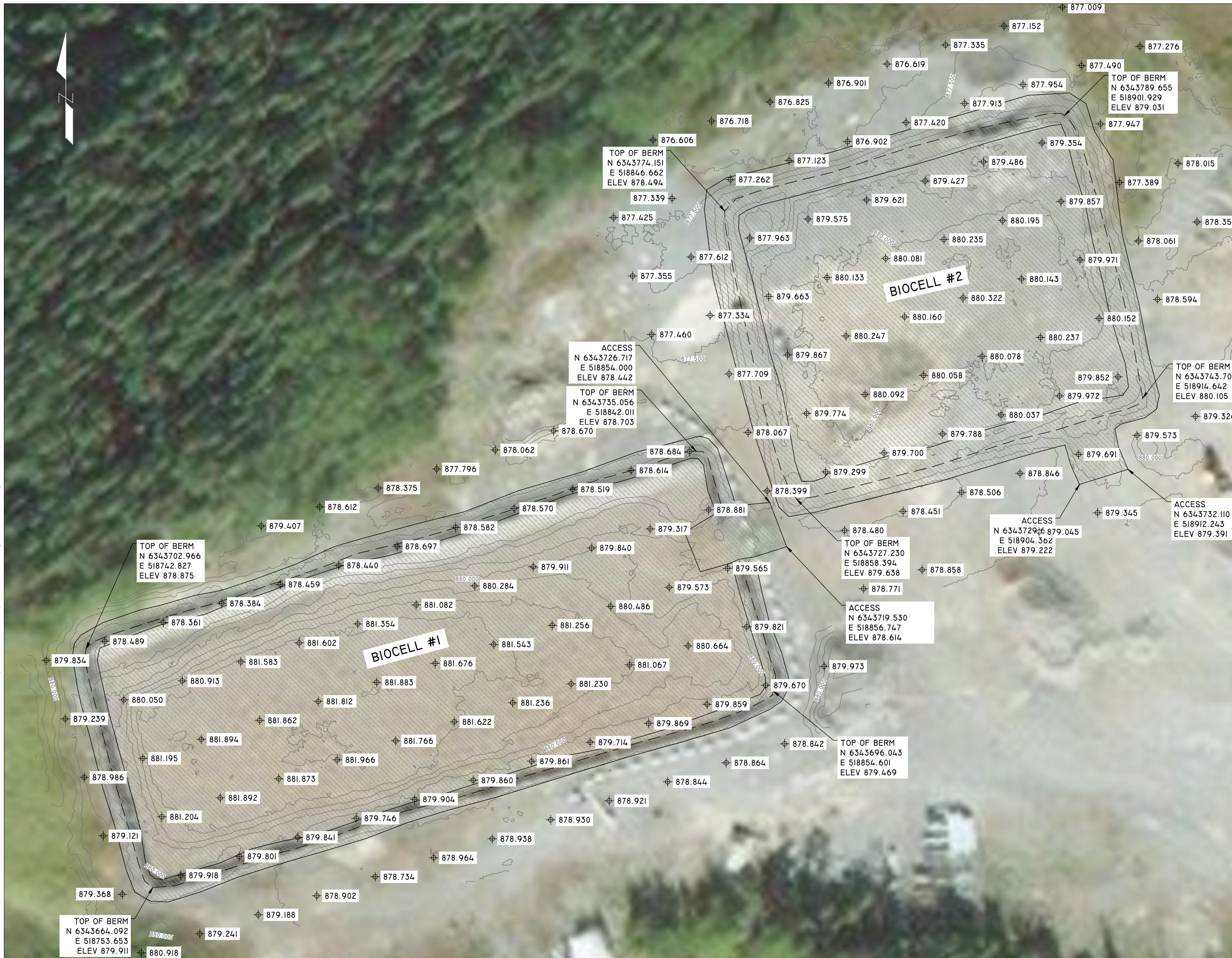
INDEX & LOCATION PLAN

CONTRACT NO.:

EZ897-181206/001/PWY

FILE NO. -	SITE PROJECT NO. 53-17-E1555
MICROFILM NO. -	DRAWING NO. ID-001

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- LEGEND:**
- PLAN VIEW**
- AS-BUILT BIOCELL MAJOR CONTOUR (1.0M INTERVAL)
 - AS-BUILT BIOCELL MINOR CONTOUR (0.2M INTERVAL)
 - AS-BUILT BIOCELL BERM TOE
 - - - AS-BUILT BIOCELL BERM CREST
 - ▨ AS-BUILT BIOCELL AREA
 - 488.857 AS-BUILT BIOCELL MAJOR CONTOUR LABEL
 - ⊕488.850 AS-BUILT BIOCELL SPOT ELEVATION

NOTES:

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2) ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED

No.	DESCRIPTION	DATE	BY	APP'D



APPROVED FOR	BY	DATE
-	-	-
AS-BUILT	JMZ	01/11/2017
COORDINATE SYSTEM	UTM NAD83 - ZONE 10 NORTH	
GEOID MODEL	CANADA GEOID MODEL HT2_0	

SCALE:

	BY	DATE
SURVEYED	WSP	VARIES
DRAWN	JMZ	01/11/2017
CHECKED	JMZ	01/11/2017

Public Works and Government Services Canada

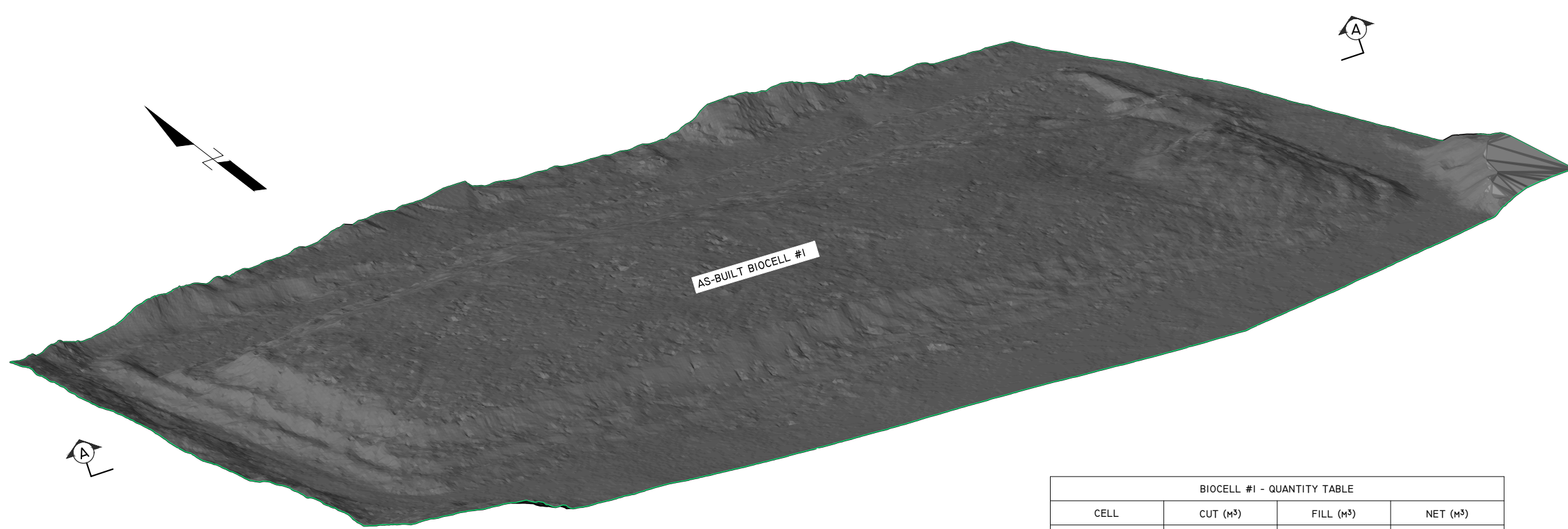
PROJECT:
CONTRACT FOR THE REMEDIATION OF SIKANNI CHIEF BIOCELL IN THE PROVINCE OF BRITISH COLUMBIA

SHEET TITLE:
SIKANNI CHIEF BIOCELL REMEDIATION

AS-BUILT BIOCELL #1 & #2

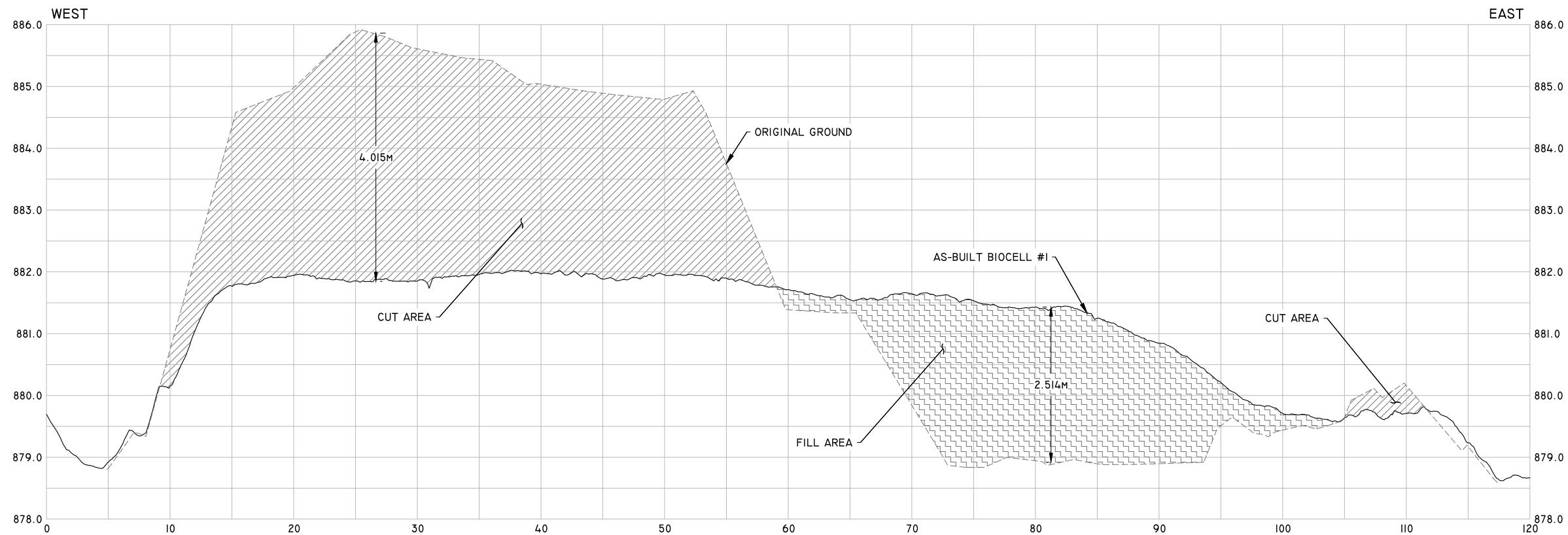
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TERRAIN VIEW
SCALE H 1:400

BIOCELL #1 - QUANTITY TABLE			
CELL	CUT (m ³)	FILL (m ³)	NET (m ³)
BIOCELL #1	5592.550	1283.880	4108.670 CUT



SECTION A
SCALE H 1:400 - V 5x

LEGEND:

- SECTION VIEW
- AS-BUILT BIOCELL
- ORIGINAL GROUND
- CUT AREA
- FILL AREA

NOTES:

1) THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND REPRESENTS AS-BUILT SURVEY DATA THAT WAS COLLECTED BETWEEN OCTOBER AND NOVEMBER OF THE YEAR 2016 AS WELL AS DATA COLLECTED BETWEEN OCTOBER AND NOVEMBER OF THE YEAR 2017. SITE ENERGY SERVICES WILL NOT BE HELD ACCOUNTABLE FOR ANY DIFFERENCE BETWEEN THE DATA SHOWN AND ANY DATA COLLECTED BEFORE OR AFTER THE DATES OUTLINED ABOVE.

2) ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED

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No.	DESCRIPTION	DATE	BY	APP'D

CONSULTANT:



APPROVED FOR	BY	DATE
-	-	-
AS-BUILT	JMZ	01/11/2017
COORDINATE SYSTEM	UTM NAD83 - ZONE 10 NORTH	
GEOID MODEL	CANADA GEOID MODEL HT2_0	
SCALE:		
	BY	DATE
SURVEYED	WSP & RAYMAC	VARIES
DRAWN	JMZ	01/11/2017
CHECKED	JMZ	01/11/2017



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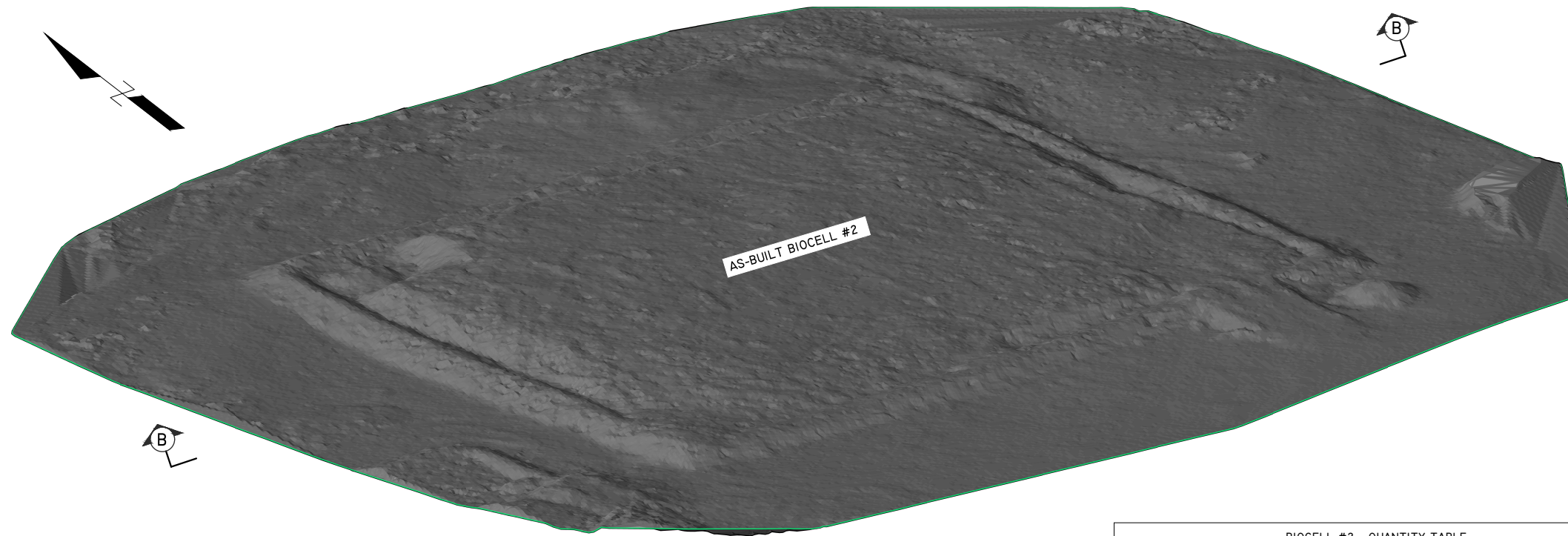
PROJECT:
CONTRACT FOR THE REMEDIATION OF SIKANNI CHIEF BIOCELL IN THE PROVINCE OF BRITISH COLUMBIA

SHEET TITLE:
SIKANNI CHIEF BIOCELL REMEDIATION
BIOCELL #1 - CROSS SECTION & VOLUME

CONTRACT NO.:
EZ897-181206/001/PWY

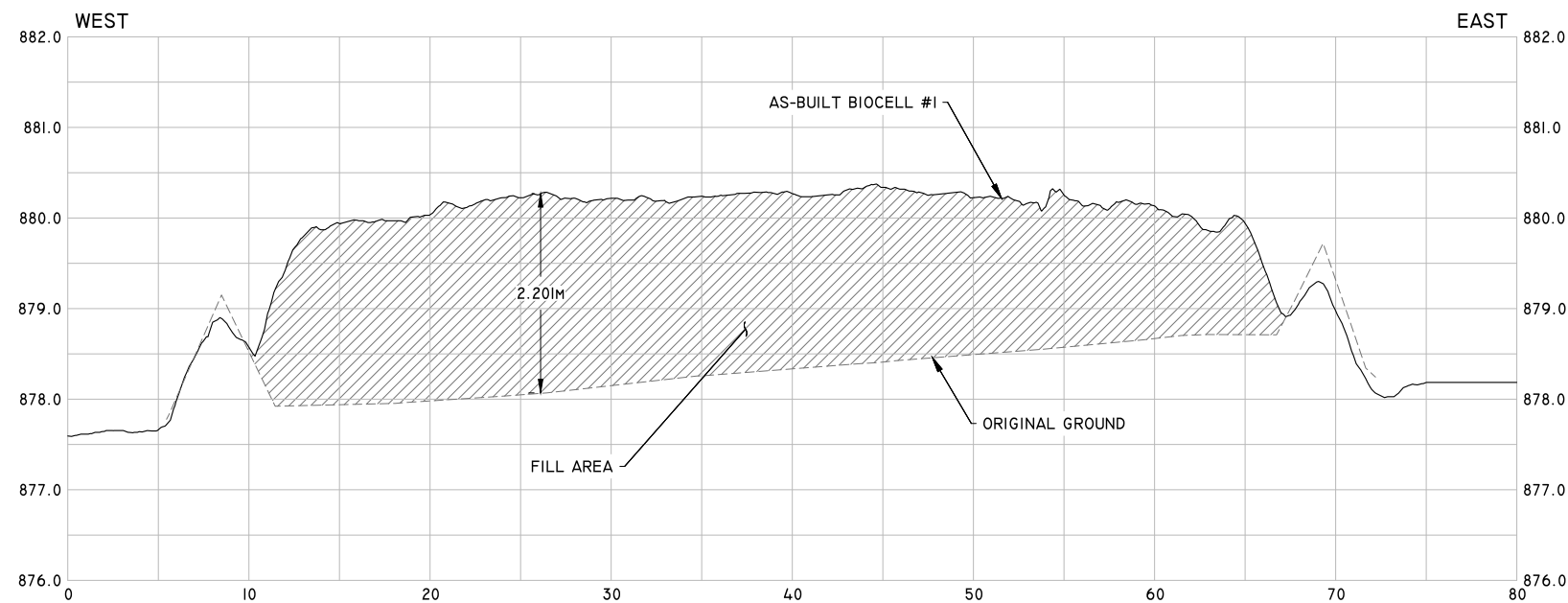
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MICROFILM NO.: - **DRAWING NO.:** CS-001



TERRAIN VIEW
SCALE H 1:400

BIOCELL #2 - QUANTITY TABLE			
CELL	CUT (m ³)	FILL (m ³)	NET (m ³)
BIOCELL #2	134.850	5935.070	3800.220 CUT



SECTION B
SCALE H 1:400 - V 5x

LEGEND:

- SECTION VIEW
- AS-BUILT BIOCELL
- ORIGINAL GROUND
- CUT AREA

NOTES:

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2) ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED

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△				
No.	DESCRIPTION	DATE	BY	APP'D

CONSULTANT:



APPROVED FOR	BY	DATE
-	-	-
AS-BUILT	JMZ	01/11/2017
COORDINATE SYSTEM	UTM NAD83 - ZONE 10 NORTH	
GEOID MODEL	CANADA GEOID MODEL HT2_0	
SCALE:		
	BY	DATE
SURVEYED	WSP & RAYMAC	VARIES
DRAWN	JMZ	01/11/2017
CHECKED	JMZ	01/11/2017



**Public Works and
Government Services
Canada**

PROJECT:

**CONTRACT FOR THE REMEDIATION OF
SIKANNI CHIEF BIOCELL
IN THE PROVINCE OF BRITISH COLUMBIA**

SHEET TITLE:

**SIKANNI CHIEF BIOCELL REMEDIATION

BIOCELL #2 - CROSS SECTION & VOLUME**

CONTRACT NO.

EZ897-181206/001/PWY

FILE NO.

-

SITE PROJECT NO.

53-17-EI555

MICROFILM NO.

-

DRAWING NO.

CS-002