

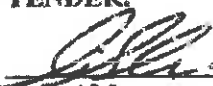




**Public Works and Government
Services Canada**

Requisition No.:	<u>EZ897-181285/A</u>
Buy and Sell ID No.:	_____
Specifications for	
Title: Watson Lake Barrel Removal Program	
Location: Watson Lake, Yukon	
Project No. E.084260.001	Date 2017-09-06

APPROVED BY:	
 Regional Manager ES	<u>2017-09-06</u> Date
 Construction Safety Coordinator	<u>2017-09-07</u> Date
TENDER:	
 Project Manager	<u>sep 6, 2017</u> Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
#219 - 800 Burrard Street, Vancouver, B.C. V6Z 6E9

Canada

WATSON LAKE AIRPORT
APEC 5 REMEDIATION - BARREL REMOVAL
WATSON LAKE AIRPORT, YUKON
SLR Project No.: 205.03873.00000

Prepared by
SLR Consulting (Canada) Ltd.

for

PUBLIC SERVICES AND PROCUREMENT CANADA
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07 September 2017

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SUMMARY OF WORK**1. PART 1 - GENERAL**

Contractor services are required to mobilize to Watson Lake Airport, Yukon Territory Canada in order to remove approximately 90 barrels and other underwater debris located under the surface of Watson Lake. Barrels are located at several different locations in Watson Lake adjacent to the Watson Lake Airport shoreline at various water depths. Barrels are in various states of condition ranging from largely intact to corroded or otherwise comprised. The barrels likely contain small amounts of hydrocarbons and/or pesticide or pollutant residue. Work will involve provision of services to lift submerged barrels from the lake bottom, as well as other objects including tires and metal objects, removal from the lake and transport to shore, sampling, sorting and handling and proper disposal of all recovered barrels, barrel contents and other debris at appropriate off-site facilities. Throughout the removal and recovery process, barrels shall be handled in contained areas such that any barrel contents are contained and all runoff is properly managed and disposed of at an appropriate off-site location.

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.
- 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. Site Location is shown in Drawing 1.
- 1.1.3. Site Preparation will be paid in accordance with lump sum price established to prepare the Site for planned barrel storage and handling, Transfer/Interim Storage Facility for temporary barrel/drum staging area with containment areas for barrels and other recovered waste objects, barrel packing and shipping, and related construction works. Includes clearing and grubbing, and containment areas that protect soils and groundwater from barrel contents leakage. Also includes removal of any incidental or generated material. Refer to Site Layout shown in Drawing 2 and Proposed Work Area in Drawing 3.
- 1.1.4. 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 temporary structures and facilities, Transfer/Interim Storage Facility for temporary containment for recovered barrels, containment for other recovered waste objects, environmental protection, barrel processing handling, and barrel / waste packing for transportation offsite, access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, diving related facility and dive tank compressor, boat storage and related watercraft requirements, fuel and refuelling systems, storm water management infrastructure, lighting, and utilities (Drawing 3).

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- 1.1.5. Site Facilities (Drawing 3) - Operation will be paid in accordance with unit price established to operate and maintain all infrastructures between mobilization and demobilization. Includes temporary structures and facilities, environmental protection, temporary containment for recovered barrels, Transfer/Interim Storage Facility containment for other recovered waste objects, environmental protection, barrel processing handling, and barrel / waste packing for transportation offsite , access, onsite roadways, temporary hoarding, security fencing, federal signage, office facilities, sanitary facilities, water management infrastructure, lighting, and utilities. Also includes ongoing services including administration, overhead, project management, 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.
- 1.1.6. 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. Reviews, sampling, or other work conducted by the Departmental Representative with time allowances in accordance with the Contract will result in no increase to the Contract Amount nor Extension of Time for completion of the Work.
- 1.1.7. Contaminated Water Treatment 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 barrel / waste storage. Includes onsite Water Treatment Plant and discharge piping. Includes loading facilities for offsite Water Treatment Plant.
- 1.1.8. Contaminated Water Treatment Operation will be paid in accordance with the unit rate price established for volume (litres) of water treated to operate and maintain onsite Contaminated Water Treatment facilities. Measurement as recorded volume by certified flow meters. 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 barrel storage. Includes onsite Water Treatment Plant

SUMMARY OF WORK

- and discharge piping. Includes loading facilities for offsite Water Treatment Plant. Includes analytical testing to demonstrate compliance with Contract.
- 1.1.9. Barrel Recovery and Removal of submerged barrels will be paid in accordance with unit rate price established for number of barrels identified in Drawing 5 Base Work – Location of Objects Requiring Removal/Disposal, and Appendix A - Location, Quantity and Condition of Barrels and Other Objects to be removed from Watson Lake. Includes removal of all barrels, removal of barrels containing special waste, and barrels containing contaminated material and non-contaminated barrel material. Includes all diver operations for salvage, boat operations for salvage, handling of barrels and other objects, underwater handling, underwater lifting, overwater lifting and all loading, hauling, unloading, transfer to shore, temporary storage and sorting in a sealed containment storage area, analytical testing of the contents of the barrels, sorting and consolidating by type, condition and contents, and crushing, if required. Material to be stored and handled within contained work area as directed by Departmental Representative. Measurement as recorded units by Departmental Representative. Does not include Transport or Disposal of debris.
- 1.1.10. Other Associated Waste Objects will be paid in accordance with unit rate price established for number of objects identified in Drawing 5 Base Work – Location of Objects Requiring Removal/Disposal, and Appendix A - Location, Quantity and Condition of Barrels and Other Objects to be removed from Watson Lake. Includes removal of all known objects and other incidental waste items objects, including tires, radiators, steel, metal debris, wood debris, crates and pipe. . Includes all diver operations for salvage, boat operations for salvage, handling of barrels and other objects, underwater handling, underwater lifting, overwater lifting and all loading, hauling, unloading, transfer to shore, temporary storage and sorting in a sealed containment storage area, sorting and stockpiling, if required. Material to be stored and handled within contained work area as directed by Departmental Representative. Measurement as recorded units by Departmental Representative. Does not include Transport or Disposal of debris.
- 1.1.11. Transport - Contaminated Material: Hazardous / Special Waste will be paid in accordance with unit rate price established for weight of Hazardous Waste material transported. Measurement as recorded on Treatment Facility or Disposal Facility weigh scale certified by Measurement Canada and results provided to Departmental Representative. Includes all handling, loading, hauling, unloading, interim storage, and final placement. If material is taken to a Treatment Facility Offsite before a Disposal Facility, payment includes transport to both Treatment Facility and Disposal Facility. .
- 1.1.12. Transport - Contaminated Material: Waste Quality will be paid in accordance with unit rate price established for weight of Waste Quality material transported. Measurement as recorded on Treatment Facility or Disposal Facility weigh scale certified by Measurement Canada and results provided to Departmental Representative. Includes all handling, loading, hauling, unloading, interim storage, and final placement. If material is taken to a Treatment Facility Offsite

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before a Disposal Facility, payment includes transport to both Treatment Facility and Disposal Facility.

- 1.1.13. Transport - Non-Contaminated Material and Waste will be paid in accordance with unit rate price established for weight of material removed. Measurement as recorded on Landfill weigh scale certified by Measurement Canada and results provided to Departmental Representative. Includes all handling, loading, hauling, unloading, interim storage, and final placement.
- 1.1.14. Disposal - Contaminated Material: Hazardous Waste / Special Waste will be paid in accordance with unit rate price established for weight of Hazardous Waste material disposed. Measurement as recorded on Disposal Facility weigh scale certified by Measurement Canada and results provided to Departmental Representative on Certificates of Disposal. Contaminated Material Disposal includes Contaminated Material Treatment Offsite, as required by Disposal Facility
- 1.1.15. Disposal - Contaminated Material: Waste Quality will be paid in accordance with unit rate price established for weight of Waste Quality material disposed. Measurement as recorded on Disposal Facility weigh scale certified by Measurement Canada and results provided to Departmental Representative on Certificates of Disposal. Contaminated Material Disposal includes Contaminated Material Treatment Offsite, as required by Disposal Facility. Disposal - Non-Contaminated Material and Waste will be paid in accordance with unit rate price established for weight of material disposed. Measurement as recorded on Landfill facility weigh scale certified by Measurement Canada and results provided to Departmental Representative on Landfill Receipts.
- 1.1.16. 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, topsoil reuse, revegetation, and deconstructing and removal from Site all temporary facilities and removal of any incidental or generated material.
- 1.1.17. 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.
- 1.1.18. Closeout Submittals will be paid in accordance with lump sum price established for Final Site Inspection (for Certificate of Completion purposes), Closeout Meetings, provision of final as-built documents and completion documents as directed by the Departmental Representative.

1.2. Definitions

- 1.2.1. Certificate of Completion: see General Conditions.
- 1.2.2. Change Order: PWGSC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.
- 1.2.3. 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.

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- 1.2.4. Contaminated Material: soil, sediment, and other solid 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 and Waste Quality. Does not include Non-Contaminated Material or Waste. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:
- 1.2.4.1. For all sites: Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines and CCME Canada-Wide Standards.
- 1.2.4.2. For sites in Yukon, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): Yukon Special Waste Regulation, Yukon Contaminated Sites Regulation.
- 1.2.5. Contaminated Material Extents: lateral and vertical extents of Contaminated Material to be remediated to meet remediation objectives. Extents on Drawings are approximate and may vary based on field observations or Confirmation Samples. Does not include Topsoil, Overburden, or material excavated as part of Temporary Sloping and Shoring.
- 1.2.6. Contaminated Water: liquid 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) meet or exceed the levels specified in policies and regulations. Includes Hazardous Waste (and/or Special Waste) and water that is not suitable for aquatic life, irrigation, livestock or drinking water or any other water use specified in the Yukon Contaminated Sites Regulation, as applicable. Includes Non-Aqueous Phase Liquids (NAPL). Does not include Non-Contaminated Water or Sewage Wastewater. Relevant regulations, unless otherwise in accordance with the Contract or as directed by the Departmental Representative, include:
- 1.2.6.1. For all sites: Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines and CCME Canada-Wide Standards.
- 1.2.6.2. For sites in Yukon, may include risk-based site-specific target levels for remediation objectives (ie CCME Tier 3): Yukon Special Waste Regulation, Yukon Contaminated Sites Regulation.
- 1.2.7. 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.
- 1.2.8. Contract: see General Conditions.
- 1.2.9. Contract Amount: see General Conditions.
- 1.2.10. Contractor: see General Conditions.
- 1.2.11. Departmental Representative: see General Conditions.

SUMMARY OF WORK

- 1.2.12. 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.
- 1.2.13. Disposal Facility: a facility specifically used to introduce waste into the environment for the purpose of final burial.
- 1.2.14. 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.
- 1.2.15. 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.
- 1.2.16. 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.
- 1.2.17. Extension of Time: see General Conditions.
- 1.2.18. Extension of Time on Contracts: PWGSC form requesting an Extension of Time.
- 1.2.19. Final Completion: see General Conditions.
- 1.2.20. Hazardous Waste: Contaminated Material which meets the regulatory definition of Hazardous Waste.
- 1.2.21. Land Treatment Facility: equivalent of Soil Treatment Facility.
- 1.2.22. Landfill Facility: an existing offsite facility located in Canada that is 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.
- 1.2.23. 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.
- 1.2.24. Non-Contaminated Material: barrels, and other debris such as tires and / or other solid material including debris recovered from the lake bottom incidentally which meets:
 - 1.2.24.1. For sites in Yukon: the Yukon Contaminated Sites Regulation most stringent of Schedule 1 and 2.
- 1.2.25. Non-Contaminated Water: liquids which are suitable for direct discharge to the environment, and which is not Contaminated Water or Sewage Wastewater.

SUMMARY OF WORK

- Includes surface runoff, stormwater, and groundwater which has not come into contact with Contaminated Material.
- 1.2.26. On Site Instruction: notices, instructions, or directions issued by the Departmental Representative to the Contractor.
 - 1.2.27. On Site Notice: notice or other communication issued by the Contractor to the Departmental Representative.
 - 1.2.28. Overburden: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is suitable as Backfill. Does not include Topsoil or material excavated as part of Temporary Sloping and Shoring.
 - 1.2.29. Progress Payment: see General Conditions.
 - 1.2.30. PWGSC: Public Works and Government Services Canada. Representative of Canada with control of the Site.
 - 1.2.31. Qualified Professional: a person working for the Contractor who is registered in relevant jurisdiction with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and through suitable education, experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise. Includes Geotechnical Engineers, Environmental Consultants, and Land Surveyors.
 - 1.2.32. Quote: Contractor's cost estimate issued to the Departmental Representative as per the relevant Contemplated Change Notice via an On Site Notice.
 - 1.2.33. Remediation by Excavation: complete excavation of Contaminated Material and incidental Non-Contaminated Material 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.
 - 1.2.34. Sewage Wastewater: 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.
 - 1.2.35. Site: work area available to Contractor according to Drawings. Does not include shared or public areas, including common roads.
 - 1.2.36. Special Waste: Yukon equivalent of Hazardous Waste.
 - 1.2.37. Subcontractor: see General Conditions.
 - 1.2.38. 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.
 - 1.2.39. Substantial Performance: see General Conditions.
 - 1.2.40. Superintendent: see General Conditions
 - 1.2.41. Supplier: see General Conditions.
 - 1.2.42. Survey by Departmental Representative: survey conducted by Departmental Representative, or by Departmental Representative's consultant or by Land

SUMMARY OF WORK

Surveyor retained by Departmental Representative. Survey may be performed by physical measurement (e.g. tape measurer) or by survey equipment (e.g. Global Positioning System, total station). Contractor may perform independent survey using a Qualified Professional to confirm Survey by Departmental Representative.

- 1.2.43. Topsoil: Non-Contaminated Material excavated incidentally above Contaminated Material Extents that is a surface organic layer to facilitate vegetation growth. Does not include Overburden or material excavated as part of Temporary Sloping and Shoring.
- 1.2.44. Transfer/Interim Storage Facility: a facility specifically used to transfer or short term storage Contaminated Material during offsite transport.
- 1.2.45. Treatment Facility: a facility specifically used to treat Contaminated Material. May be Owner's (PWGSC provided) or Offsite (Contractor provided). Owner's Soil Treatment Facility is located on property under PWGSC control, but may be located at a different location than where construction work occurs. Offsite Treatment Facility may treat soil, sediment, or water.
- 1.2.46. Waste: Non-Contaminated Material that is not soil. Includes cleared and grubbed vegetation, litter, tires, empty barrels, rubbish, debris, excess construction material, lumber, steel, plastic, concrete, and asphalt. Includes Topsoil and Overburden that is not re-used.
- 1.2.47. Waste 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.
- 1.2.48. Waste Quality: soil or other material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands or any other land use specified in the BC Contaminated Sites Regulation or Yukon Contaminated Sites Regulation, as applicable.
- 1.2.49. Waste Reduction Plan: a written report which addresses opportunities for reduction, reuse or recycling of materials.
- 1.2.50. Work: see General Conditions.
- 1.2.51. Working Day: see General Conditions.

1.3. Action and Informational Submittals

- 1.3.1. 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 in the opinion of the Departmental Representative and if request can be reasonably accommodated by other contracts.

SUMMARY OF WORK**1.4. Work Covered by Contract**

- 1.4.1. Contractor must provide personnel with appropriate experience in remediating contaminated materials. Contractor to provide specialized material handling, health and safety, and environmental protection procedures.
- 1.4.2. 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:
 - 1.4.2.1. Pre-Mobilization Submittals.
 - 1.4.2.2. Mobilization.
 - 1.4.2.3. Site Preparation.
 - 1.4.2.4. Site Facilities Provision.
 - 1.4.2.5. Site Facilities Operation.
 - 1.4.2.6. Standby Time.
 - 1.4.2.7. Barrel Recovery and Removal.
 - 1.4.2.8. Other Associated Waste Objects.
 - 1.4.2.9. Transport – Contaminated Material: Hazardous Waste / Special Waste.
 - 1.4.2.10. Transport – Non-Contaminated Material and Waste.
 - 1.4.2.11. Disposal – Contaminated Material: Hazardous Waste / Special Waste.
 - 1.4.2.12. Disposal – Non-Contaminated Material and Waste.
 - 1.4.2.13. Site Restoration.
 - 1.4.2.14. Demobilization.
 - 1.4.2.15. Closeout Submittals.
- 1.4.3. Green Requirements:
 - 1.4.3.1. 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.
 - 1.4.3.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.
 - 1.4.3.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from Landfill Facility.
- 1.4.4. Work not included in the Contract comprises such work and services specifically listed as:
 - 1.4.4.1. Not Used.

1.5. Location

- 1.5.1. The Site location is shown on Drawings.
- 1.5.2. There is no civic street address or PIN for the Site.

1.6. Project/Site Conditions

- 1.6.1. Work at Site will involve Work with contaminated materials. Complete list of anticipated contaminants and concentration levels on the Site available separately in assessment reports and/or Drawings.

SUMMARY OF WORK

- 1.6.2. Existing condition on the Site identified according to Drawings.
- 1.6.3. Utilities/services availability on Site:
 - 1.6.3.1. Electrical power is be available on Site.
 - 1.6.3.2. Water is not available on Site.
 - 1.6.3.3. Sanitary sewer is not available on Site.
 - 1.6.3.4. Storm sewer is not available on Site.
 - 1.6.3.5. Telecommunications is not available on Site. Cell phone coverage is available.

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. Products Supplied by the Departmental Representative

- 1.8.1. Not Used.

1.9. Contractor's Use of Site

- 1.9.1. Use of Site:
 - 1.9.1.1. For the sole benefit of Canada.
 - 1.9.1.2. Exclusive and only for completion of the execution of Work.
 - 1.9.1.3. Assume responsibility for assigned premises for performance of this Work.
 - 1.9.1.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
 - 1.9.1.5. The Site is located within or directly adjacent to the boundaries of the Watson Lake Airport. Watson Lake is a certified Yukon government airport and an area of land used or designated in part for the arrival, departure, movement or servicing of aircraft. Contractor shall adhere to airport operations rules and regulations, work within direction of the airport manager
- 1.9.2. There are no pre-existing arrangements for encroachment on the neighbouring properties.
- 1.9.3. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
- 1.9.4. Do not unreasonably encumber Site with material or equipment.
- 1.9.5. Accommodate common areas with other Site users, including roadways.

SUMMARY OF WORK

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

1.10. Existing Permits

- 1.10.1. Existing permits are:

- 1.10.1.1. None

1.11. Schedule Requirements

- 1.11.1. Work to be initiated: within 5 Working Days of Contract Award.

- 1.11.2. Pre-Mobilization Submittals: within 10 Working Days of Contract Award.

- 1.11.3. Mobilization: within 10 Working Days of Contract Award.

- 1.11.4. Base Work:

- 1.11.4.1. Substantial Completion no later than 8 weeks following Contract Award.

- 1.11.4.2. Offsite Disposal Works: Final Completion no later than 2017 November 15.

- 1.11.5. Completion of the Work: no later than 2017 December 31. Includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

1.12. Hours of Work

- 1.12.1. Restrictive as follows:

- 1.12.1.1. Working Day work hours are unrestricted.

- 1.12.1.2. Contractor to define Working Day prior to start of work.

- 1.12.2. Obtain consent from Departmental Representative for all after hours Work, including weekends and holidays.

- 1.12.2.1. Proceed only as directed by the Departmental Representative.

1.13. Security Clearances

- 1.13.1. 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

GENERAL INSTRUCTIONS

1. PART 1 - GENERAL**1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

- 1.3.1. Utility Locations: at least 5 Working Days prior to commencing any subsurface disturbance, Submit drawings identifying all utilities on the Site. Update drawings as directed by the Departmental Representative.
- 1.3.2. 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.
- 1.3.3. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work. Include:
- 1.3.3.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.
- 1.3.3.2. Description of Work performed.
- 1.3.3.3. Current Site conditions.
- 1.3.3.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.
- 1.3.3.5. Signature of Superintendent.
- 1.3.4. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:
- 1.3.4.1. 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.
- 1.3.4.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.
- 1.3.5. 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.
- 1.3.6. Quality Management Plan: within 10 Working Days after Contract award, Submit a quality management plan. Include:
- 1.3.6.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.
- 1.3.6.2. Subcontractors responsible for review, inspection and testing.
- 1.3.6.3. Schedule of submittals of review, inspection and testing results.

GENERAL INSTRUCTIONS

- 1.3.7. **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.

1.4. Division of Specifications

- 1.4.1. This specification is subdivided into Divisions and Sections in accordance with the six digit National Master Specifications System.
- 1.4.2. A Division or Section may consist of the Work of more than one Subcontractor. Responsibility for determining which Subcontractor provides the labour, material, equipment and services required to complete the Work rests solely with the Contractor.

1.5. Documents Required

- 1.5.1. Maintain 1 copy each of the following posted at the job Site:
- 1.5.1.1. General Conditions.
 - 1.5.1.2. Drawings.
 - 1.5.1.3. Specifications.
 - 1.5.1.4. Addenda or other modifications to Contract.
 - 1.5.1.5. Change orders.
 - 1.5.1.6. Copy of current Work schedule.
 - 1.5.1.7. Reviewed and final Shop Drawings Submittals.
 - 1.5.1.8. One set of record Shop Drawings and Specifications for “as-built” purposes.
 - 1.5.1.9. Field and laboratory test reports.
 - 1.5.1.10. Reviewed and accepted Submittals.
 - 1.5.1.11. Manufacturers’ installation and application instructions (as appropriate).
 - 1.5.1.12. National Building Code of Canada (as appropriate).
 - 1.5.1.13. Current construction standards of workmanship listed in technical Sections (as appropriate).
 - 1.5.1.14. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
 - 1.5.1.15. Environmental Protection Plan.
 - 1.5.1.16. Quality Management Plan.
 - 1.5.1.17. Final Meeting Minutes, Agendas and associated attachments.
 - 1.5.1.18. Permits and other approvals.

1.6. Setting out of Work

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

GENERAL INSTRUCTIONS**1.7. Acceptance of Substrates**

- 1.7.1. Each trade must examine surfaces prepared by others and job conditions which can affect his work, and must report defects to the Departmental Representative. Commencement of Work will imply acceptance of prepared Work or substrate surfaces.

1.8. Works Coordination

- 1.8.1. Coordinate Work of Subcontractors.
- 1.8.1.1. Designate one person to be responsible for review of Contract and Shop Drawings and managing coordination of Work.
- 1.8.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.
- 1.8.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract, to assist them in planning and carrying out their respective work.
- 1.8.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.
- 1.8.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.
- 1.8.2.4. Publish minutes of each meeting.
- 1.8.2.5. Submit a copy of coordination drawings and meeting minutes as directed by the Departmental Representative.
- 1.8.3. Submit Shop Drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.
- 1.8.4. Work coordination:
- 1.8.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.
- 1.8.4.2. 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.
- 1.8.4.3. Ensure disputes between Subcontractors are resolved.
- 1.8.5. Failure to coordinate Work is responsibility of Contractor.

1.9. Approvals of Shop Drawings, Product Data and Samples

- 1.9.1. Submit as directed by the Departmental Representative the requested Shop Drawings, product data, MSDS sheets and samples in accordance with the Contract.
- 1.9.2. Allow sufficient time for the following:
- 1.9.2.1. Review of product data.
- 1.9.2.2. Acceptance of Shop Drawings.
- 1.9.2.3. Review of re-submission.
- 1.9.2.4. Ordering of accepted material and/or products.

1.10. Relics and Antiquities

- 1.10.1. See General Conditions.

GENERAL INSTRUCTIONS**1.11. Additional Drawings**

- 1.11.1. The Departmental Representative may furnish additional Drawings for clarification. These additional Drawings have the same meaning and intent as if they were included with Drawings referred to in the Contract.
- 1.11.2. Upon request, Departmental Representative may furnish up to a maximum of 2 sets of Drawings for use by the Contractor at no additional cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

1.12. Record Keeping

- 1.12.1. On Site Instruction: Contractual correspondence from the Departmental Representative to the Contractor. Does not include Contemplated Change Notices; Change Orders, and Extension of Time on Contracts. Sequentially numbered On Site Instructions. Include cross references to applicable On Site Notifications. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Instructions.
- 1.12.2. On Site Notifications: Contractual correspondence from Contractor to the Departmental Representative. Includes Submittals. Does not include Quotes, and Extension Of Time On Contracts. Must be as a sequentially numbered On Site Notifications. Include cross references to applicable On Site Instructions. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Notifications.
- 1.12.3. Maintain adequate records to support information provided to Departmental Representative.
- 1.12.4. 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.
- 1.12.5. Maintain bills of lading for minimum of 300 Working Days from date of shipment or longer period required by applicable law or regulation.

1.13. Change Documents

- 1.13.1. Change Documents do not relieve Contractor of any obligation.
- 1.13.2. Change Documents do not change the Contractor's responsibility for sequencing, methods and means.
- 1.13.3. Change Documents do not change by any reason the status of the Contractor, including the function of Prime Contractor or as supervisor.
- 1.13.4. Change Documents include:
 - 1.13.4.1. 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.
 - 1.13.4.2. 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.

GENERAL INSTRUCTIONS

- 1.13.4.3. Extension of Time on Contracts: No increase to the Contract Amount by reason of any Extension of Time on Contracts. There may be an Extension of Time for completion of the Work by reason of an Extension of Time on Contracts.
- 1.13.4.4. 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.

1.14. System of Measurement

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

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. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

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.

PROJECT MEETINGS**1.5. Preconstruction 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.
 - 1.5.4.3. Schedule of Submittals.
 - 1.5.4.4. Requirements for temporary facilities.
 - 1.5.4.5. Site security.
 - 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. Quantity results.
 - 1.6.3.10. 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.
 - 1.6.3.11. Problems which impede construction schedule.
 - 1.6.3.12. Corrective measures and procedures to regain projected schedule.
 - 1.6.3.13. Revision to construction schedule.
 - 1.6.3.14. Progress schedule, during succeeding Work period.

- 1.6.3.15. Review submittal schedules: expedite as required.
- 1.6.3.16. Maintenance of quality standards.
- 1.6.3.17. Quantities of material transported, treated, and disposed.
- 1.6.3.18. Review proposed changes for effect on construction schedule and on Final Completion date.
- 1.6.3.19. 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 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.
 - 1.7.3.2. Coordination activities required between Contractor, Subcontractor(s), Departmental Representative, and other contractor(s) including environmental consultant.
 - 1.7.3.3. Health and Safety items.
 - 1.7.3.4. Environmental Protection items.

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.

PROJECT MEETINGS

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

CONSTRUCTION PROGRESS**1. PART 1 - GENERAL****1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Master Plan: within 10 Working Days after Contract award. Submit a Master Plan (baseline schedule).

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 remain within specified Contract duration.

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 sequence, methods and means 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 include 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.

CONSTRUCTION PROGRESS

1.6. Project Schedule

- 1.6.1. Develop detailed Project Schedule derived from 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 approved dates shown on baseline schedule.
- 1.8.2. Weather related delays with their remedial measures will be discussed and schedule negotiated, costs will not be 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

SUBMITTAL PROCEDURES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

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 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 sequence, methods and means.

1.4.2. This section specifies general requirements and procedures for the Contractor's Submittals of Shop Drawings, product data, samples and other submittals in accordance with the Contract to Departmental Representative. Additional specific requirements for Submittals are identified in individual technical sections.

1.4.3. Present Shop Drawings, product data and samples in SI Metric units.

1.4.4. Where items or information is not produced in SI Metric units, converted values are acceptable.

1.4.5. Contractor's responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative's review of Submittals.

1.4.6. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.

1.4.7. 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.

1.4.8. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit as directed by the Departmental Representative.

1.4.9. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those directed by the Departmental Representative.

1.4.10. Do not proceed with Work until relevant Submittals are finalized and have been accepted.

1.4.11. 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.

1.4.12. Review Submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and

SUBMITTAL PROCEDURES

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.

- 1.4.13. Verify field measurements and affected adjacent works are coordinated.
- 1.4.14. 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. If adjustments result in an increase to the Contract Amount or an Extension of Time for completion of the Work, notify Departmental Representative and receive approval prior to proceeding with Work.
- 1.4.15. 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.
- 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. Accompany Submittals with On Site Notification:
 - 1.5.4.1. Date.
 - 1.5.4.2. Project title and number.
 - 1.5.4.3. Contractor's name and address.
 - 1.5.4.4. Identification and quantity of each Shop Drawing, product data and sample.
 - 1.5.4.5. Other pertinent data.
- 1.5.5. Submittals must include:
 - 1.5.5.1. Date and revision dates.
 - 1.5.5.2. Project title and number.
 - 1.5.5.3. Name and address of:
 - 1.5.5.3.1. Subcontractor.
 - 1.5.5.3.2. Supplier.
 - 1.5.5.3.3. Manufacturer.
 - 1.5.5.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.
 - 1.5.5.5. Qualified Professional to sign and seal Submittals in accordance with the Contract. Submittals to include at a minimum 1 hard copy of original ink sealed document.
 - 1.5.5.6. Details of appropriate portions of Work as applicable.

1.6. Shop Drawings

SUBMITTAL PROCEDURES

- 1.6.1. Shop Drawings are designs, drawings, figures, diagrams, illustrations, schedules, performance charts, brochures and other data intended to illustrate details of a portion of the Work which are provided by the Qualified Professional of record.
- 1.6.2. Maximum sheet size: ANSI E (864 x 1118 mm).
- 1.6.3. Submit, as directed by the Departmental Representative, electronic and 2 hard copies of Shop Drawings for each requirement requested in the specification sections and/or as directed by the Departmental Representative.
- 1.6.4. Cross-reference Shop Drawing information to applicable portions of the Contract.
- 1.6.5. Qualified Professional to sign and seal each individual Shop Drawing.
- 1.6.6. Qualified Professional to sign and seal final Shop Drawings and submit as directed by the Departmental Representative upon Final Completion of the construction project. Final Shop Drawings are prepared by a Qualified Professional to reflect design changes made during the construction of the Remediation by Excavation project. Final Shop Drawings are intended to incorporate addenda, change orders and other significant design changes, but not necessarily Site directions.
- 1.6.7. Shop Drawings must include:
 - 1.6.7.1. The original date of issue.
 - 1.6.7.2. The dates of all applicable revisions.
 - 1.6.7.3. The project title.
 - 1.6.7.4. The project address.
 - 1.6.7.5. The project number.
 - 1.6.7.6. Wherever applicable, the name(s) of the: Contractor, Subcontractor(s), Supplier(s), manufacturers, and separate detailers.
 - 1.6.7.7. The sequence number for each Shop Drawing.
 - 1.6.7.8. Identifications of all products and materials.
 - 1.6.7.9. Relation to adjacent structures or materials.
 - 1.6.7.10. Clearly identified field dimensions.
 - 1.6.7.11. Applicable standards.

1.7. Shop Drawings Review

- 1.7.1. Departmental Representative's review of Shop Drawings only to determine if Shop Drawings are consistent with the general intent of the Contract and are in accordance with the Contract.
- 1.7.2. This review will not mean that Departmental Representative approves the detail design inherent in the Shop Drawings, responsibility for which will remain with Contractor submitting same.
- 1.7.3. This review will not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or of responsibility for meeting all requirements of the Contract.
- 1.7.4. Without restricting the generality of the foregoing, be responsible for:
 - 1.7.4.1. Dimensions to be confirmed and correlated at the Site.

SUBMITTAL PROCEDURES

- 1.7.4.2. Information that pertains solely to fabrication processes or to techniques of construction and installation.
- 1.7.4.3. Coordination of the Work of all sub-trades.

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. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Contaminated Material and Non-Contaminated Material Management Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit plan detailing management of Contaminated Material and Non-Contaminated Material. Include:

1.3.1.1. Sequence, methods and means to ensure different categories of waste are segregated.

1.3.1.2. Sequence, methods and means to transport and store Contaminated Material and Non-Contaminated Material onsite.

1.3.1.3. Sequence, methods and means to transport Contaminated Material and Non-Contaminated Material offsite. Include name, vehicle type, and licenses of transporters. For all transfer stations and interim storage facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.1.4. Sequence, methods and means to dispose Contaminated Material and Non-Contaminated Material offsite. Include details on disposal process and written confirmation from facility owner acknowledging suitability of facility for material to be disposed. For all Disposal Facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.2. Contaminated Water Treatment Provision Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit design, operation procedures, manufacturers' instructions, and monitoring and sampling plan of onsite Contaminated Water Treatment. Includes onsite infrastructure for onsite or offsite Water Treatment Plant.

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.

1.3.3.2. Name of Transport Company.

1.3.3.3. Weigh scale receipt including location, date, and weight of loading, as appropriate.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.3.3.4. Weigh scale receipt including location, date, and weight of unloading, as appropriate.
- 1.3.4. Certificate of Disposal: within 30 Working Days of disposal at Disposal Facility, Submit documentation verifying that materials have been disposed by Contractor. Include:
 - 1.3.4.1. Issued by the Disposal Facility.
 - 1.3.4.2. On company letterhead.
 - 1.3.4.3. Name and location of facility where the material is being disposed.
 - 1.3.4.4. Date and weight for each shipment received and total weight received at the Disposal Facility.
 - 1.3.4.5. Identification of acceptance of final ownership of material.
 - 1.3.4.6. Signed by identified authorized disposal company representative.

1.4. Sequencing and Scheduling

- 1.4.1. Commence Work involving contact with Contaminated or potentially Contaminated Material or Wastewater after all applicable Environmental Protection procedures (including those identified in Contaminated Material and Non-Contaminated Material 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. Equipment Decontamination Facility

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

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 materials from boots, clothing and skin surfaces.
- 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.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES**1.7. Barrel / Drum Staging Pad**

- 1.7.1. Provide, maintain, and operate barrel / drum staging pad or other temporary containment structure(s) as required. Barrels must be placed on liner to keep any runoff contained, including perimeter berms around the outside to contain this and cover to prevent accumulation of any rainfall.
- 1.7.2. Liner shall be of sufficient strength to allow for equipment access and without puncture or tearing.
- 1.7.3. Construct drum staging pad(s) with sump capable of collecting barrel drainage, barrel contents, sediment, leachate and rain runoff. Place recovered barrels on impermeable liner that contains and collects leachate and runoff from staging pad which is conducted solely to sump on staging pad. Leachate is Contaminated Water.
- 1.7.4. Contaminated water shall not be allowed to contact ground below storage area. Contractor will be responsible for the remediation of any contaminated soil resulting from their activities.

1.8. Progress Decontamination

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

1.9. Final Decontamination

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

1.10. Drums

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

1.11. Contaminated Water Management

- 1.11.1. Collect Contaminated Water that has, or potentially has, come into contact with Contaminated Material including barrel contents, sediments, excavation and stockpile areas, or is otherwise potentially contaminated from Work activities.
- 1.11.2. Transport and treat collected Contaminated Water at Contaminated Water Treatment Plant.

1.12. Contaminated Water Transport

Assume ownership of, and be responsible for Contaminated Water once it is loaded on a vehicle, barge, or other vessel for transport offsite.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES**1.13. Onsite Contaminated Water Treatment Plant**

- 1.13.1. Onsite Contaminated Water Treatment: at Contractor's discretion, treat at Treatment Facility onsite provided by Contractor and accepted by the Departmental Representative.
- 1.13.2. Design Requirements:
- 1.13.2.1. 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.
- 1.13.2.2. Ensure that discharges from Site are in compliance with applicable permit requirements and limitations.
- 1.13.2.3. Design piping to transfer liquid/solid mixtures generated by dewatering operations which require treatment to Contaminated Water Treatment Plant.
- 1.13.2.4. Design Contaminated Water Treatment Plant capable of receiving liquid/solid mixtures and not causing delay to dewatering operations.
- 1.13.2.5. Piping: suitable material type, of sufficient diameter and structural thickness for purpose intended; satisfactorily tested for leaks with potable water in presence of Departmental Representative before handling Contaminated Water.
- 1.13.3. Installation:
- 1.13.3.1. Prepare Site for Contaminated Water Treatment Plant.
- 1.13.3.2. Install component systems in accordance with installation procedures and as required.
- 1.13.3.3. Following installation of system, implement initial operation test in accordance with procedures developed by Contractor and submit results as directed by the Departmental Representative.
- 1.13.3.4. Install piping in accordance with manufacturer's instructions and test for leakage using potable water prior to commencing dewatering and treatment operations.
- 1.13.4. Initial Testing: determine performance of Contaminated Water Treatment Plant provided by Contractor as follows prior to commencing excavation:
- 1.13.4.1. Test run with potable water to ensure it is operating currently and no leaks are occurring.
- 1.13.4.2. Performance verification (contaminant removal) of Contaminated Water treated, stored, tested, assessed, and accepted by Departmental Representative prior to discharge.
- 1.13.4.3. Provide access for independent collection of treated stored water samples by the Departmental Representative.
- 1.13.5. Operational Testing:
- 1.13.5.1. Operate Contaminated Water Treatment Plant using experienced, qualified personnel and in accordance with manufacturer's instructions and procedures as Submittals by Contractor.
- 1.13.5.2. Collect, analyze, and assess samples as required by a Qualified Professional.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.13.5.3. Provide access for independent collection of samples by the Departmental Representative.
- 1.13.5.4. On basis of analytical results by Contractor or Departmental Representative obtained from samples collected at the discharge point, make system modifications required for effluent to satisfy effluent criteria, or continue with normal dewatering operations as directed by the Departmental Representative.
- 1.13.6. Decommissioning/Dismantling:
 - 1.13.6.1. Decontaminate and remove salvageable components of Contaminated Water Treatment Plant including treatment system, pumps, piping, and electrical equipment.
 - 1.13.6.2. 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.
- 1.13.7. Discharge to environment: obtain Discharge Approval from authority having jurisdiction.

1.14. Offsite Contaminated Water Treatment Plant

- 1.14.1. Offsite Contaminated Water Treatment: at Contractor's discretion, treat at Treatment Facility offsite provided by Contractor and accepted by the Departmental Representative.
- 1.14.2. Offsite Treatment Facility must:
 - 1.14.2.1. Be an existing offsite facility located in Canada or the United States.
 - 1.14.2.2. Be designed, constructed and operated for the handling or processing of waste in such a manner as to change the physical, chemical or biological character or composition of Contaminated Water. Treatment includes bioremediation and filtering. Treatment does not include blending, mixing, or dilution
 - 1.14.2.3. 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.
 - 1.14.2.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.14.3. Facility Authority:
 - 1.14.3.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.14.3.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.14.3.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
 - 1.14.3.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.14.4. 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.

1.15. Contaminated Material Management

- 1.15.1. Remove all sludge within barrels and other waste that may be considered Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.
- 1.15.2. Minimize generation of Contaminated Material to greatest extent practicable. Take necessary precautions to avoid spills and releasing barrels contents to soil during removal, handling, loading, sorting stockpiling, and transport of Non-Contaminated Material with Contaminated Material,.
- 1.15.3. Segregate, handle, stockpile, load, unload, haul, interim storage, treat, and dispose Contaminated Material separately into the following classifications in accordance with the Contract or as directed by the Departmental Representative based on insitu results, field observations, field measurements, and/or ex-situ
- 1.15.4. Material characterization additional to information provided in Contract required by transport, Treatment Facility or Disposal Facility responsibility of Contractor.

1.16. Offsite Contaminated Material Disposition

- 1.16.1. Treat Contaminated Material offsite as follows, otherwise in accordance with the Contract, or as directed by the Departmental Representative:
- 1.16.1.1. Hazardous Waste: May be treated at a Treatment Facility prior to disposal at a Disposal Facility. Whether Treatment is required is dependent on Contractor's methods and means to meet Transport, Disposal, Regulatory or other requirements, and is not a project requirement.
- 1.16.1.2. Waste Quality: May be treated at a Treatment Facility prior to disposal at a Disposal Facility. Whether Treatment is required is dependent on Contractor's methods and means to meet Transport, Disposal, Regulatory or other requirements, and is not a project requirement.
- 1.16.2. Dispose of Contaminated Material offsite as follows, otherwise in accordance with the Contract, or as directed by the Departmental Representative:
- 1.16.2.1. Hazardous Waste: Must be disposed at a Disposal Facility regardless of Treatment.
- 1.16.2.2. Waste Quality: Must be disposed at a Disposal Facility regardless of Treatment.

1.17. Contaminated Material Transport - Offsite

- 1.17.1. Assume ownership of, and be responsible for, Contaminated Material once it is loaded on a vehicle, barge, or other vessel for transport.
- 1.17.2. Transport material as soon as practical. Do not unreasonably stockpile material onsite.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.17.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.
- 1.17.4. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
- 1.17.5. Stabilize material as necessary.
- 1.17.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Contaminated Material.
- 1.17.7. Manifest and correlate quantities of all material transported from Site documenting quantity removed from Site, movement, transfer stations, interim storage and treatment, and weight of material at final Disposal Facility. Submit all manifests, as directed by the Departmental Representative.
- 1.17.8. Material transported with discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
 - 1.17.8.1. No manifest or an incomplete manifest.
 - 1.17.8.2. The material transported does not match the description in the manifest.
 - 1.17.8.3. The amount transported differs by more than 5% in the manifest.
 - 1.17.8.4. The material transported is in a hazardous condition.
- 1.17.9. Transfer/Interim Storage Facility must:
 - 1.17.9.1. Be an existing offsite facility located in Canada or the United States.
 - 1.17.9.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
 - 1.17.9.3. 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.
 - 1.17.9.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.17.10. Facility Authority:
 - 1.17.10.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.17.10.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.17.10.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
- 1.17.11. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

1.18. Contaminated Material Treatment - Offsite

- 1.18.1. Assume ownership of, and be responsible for, Contaminated Material treated offsite.

SPECIAL PROJECT PROCEDURES FOR CONTAMINATED SITES

- 1.18.2. Contaminated Material Treatment - Offsite: treat at Treatment Facility provided by Contractor and accepted by the Departmental Representative.
- 1.18.3. Offsite Treatment Facility must:
 - 1.18.3.1. Be an existing offsite facility located in Canada or the United States.
 - 1.18.3.2. Be designed, constructed and operated for the handling or processing of waste in such a manner as to change the physical, chemical or biological character or composition of Contaminated Material. Treatment includes bioremediation, thermal desorption, and incineration. Treatment does not include blending, mixing, or dilution
 - 1.18.3.3. 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.
 - 1.18.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.18.4. Facility Authority:
 - 1.18.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.18.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.18.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
 - 1.18.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
- 1.18.5. 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.
- 1.18.6. Material sent to an offsite Treatment Facility must subsequently be disposed of at a Disposal Facility after treatment.
- 1.18.7. If proposed Treatment Facility is not acceptable to Departmental Representative, provide an alternate Treatment Facility that is acceptable.
- 1.18.8. Submit Certificates of Treatment for all Contaminated material treated offsite.

1.19. Contaminated Material Disposal

- 1.19.1. Assume ownership of, and be responsible for, Contaminated Material disposed.
- 1.19.2. Contaminated Material Disposal: dispose Contaminated Material, including offsite treated Contaminated Material that may no longer be contaminated, at Disposal Facility provided by Contractor and accepted by the Departmental Representative.
- 1.19.3. Disposal Facility must:
 - 1.19.3.1. Be an existing offsite facility located in Canada or the United States.

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- 1.19.3.2. 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.
- 1.19.3.3. 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.
- 1.19.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.19.4. Facility Authority:
 - 1.19.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.19.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.19.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
 - 1.19.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
- 1.19.5. 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.
- 1.19.6. Material sent to a Disposal Facility must be permanently stored at that facility.
- 1.19.7. If proposed Disposal Facility is not acceptable to Departmental Representative, provide an alternate Disposal Facility that is acceptable.
- 1.19.8. Submit Certificates of Disposal for all Contaminated Material disposed offsite.

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

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Submit to Departmental Representative Submittals listed for review.

1.3.2. Work affected by Submittal must not proceed until review is complete.

1.3.3. Submit the following:

1.3.3.1. Health and Safety Plan.

1.3.3.2. Diving Operations Plan

1.3.3.3. Copies of reports or directions issued by federal and provincial health and safety inspectors.

1.3.3.4. Copies of incident and accident reports.

1.3.3.5. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by the 2015 Workplace Hazardous Materials Information System (WHMIS 2015) requirements.

1.3.3.6. Emergency Procedures.

1.3.3.7. Notice of Project.

1.3.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 Working Days after receipt of the plan.

1.3.5. If changes are required, revise the plan as appropriate and resubmit to Departmental Representative within 5 Working Days.

1.3.6. Submittal of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It will not:

1.3.6.1. Be construed to imply approval by the Departmental Representative.

1.3.6.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.

1.3.6.3. Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.4. References

1.4.1. Government of Canada:

1.4.1.1. Canada Labour Code - Part II.

1.4.1.2. Canada Occupational Health and Safety Regulations.

1.4.2. National Building Code of Canada (NBC):

1.4.2.1. Part 8, Safety Measures at Construction and Demolition Sites.

1.4.3. Canadian Standards Association (CSA) as amended:

1.4.3.1. CSA Z797-2009 Code of Practice for Access Scaffold.

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- 1.4.3.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
- 1.4.3.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
- 1.4.4. National Fire Code of Canada 2010 (as amended):
 - 1.4.4.1. Part 5 – Hazardous Processes and Operations and Division B as applicable and required.
 - 1.4.4.2. FCC No. 302, Standard for Welding and Cutting.
- 1.4.5. American National Standards Institute (ANSI):
 - 1.4.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- 1.4.6. Yukon Territory (as appropriate):
 - 1.4.6.1. Occupational Health and Safety Act.
 - 1.4.6.2. Workers' Compensation Act.
 - 1.4.6.3. Occupational Health and Safety Regulation

1.5. Diving Operations

- 1.5.1. All Diving Operations shall be in accordance with Yukon Territorial Diving Regulations and any other associated local, Federal or Territorial legislation as required.
- 1.5.2. Submit a Dive Operations Plan as per Section 1.3.3.2 for departmental review.

1.6. Regulatory Requirements

- 1.6.1. Comply with codes, acts, bylaws, standards and regulations applicable to the performance of the Work in accordance with the Contract to ensure safe operations at Site.
- 1.6.2. 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 direct on the course of action to be followed.

1.7. Worker's Coverage

- 1.7.1. 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.
- 1.7.2. 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.

1.8. Compliance with Regulations

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

HEALTH AND SAFETY FOR CONTAMINATED SITES

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

1.9. Responsibility

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

1.10. Health and Safety Coordinator

- 1.10.1. The Health and Safety Coordinator must:
- 1.10.1.1. Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the Site to perform Work.
- 1.10.1.2. Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
- 1.10.1.3. Be on Site during execution of Work.

1.11. General Conditions

- 1.11.1. Provide safety barricades and lights around Site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- 1.11.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the Site:
- 1.11.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

1.12. Project/Site Conditions

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

1.13. Work Permits

- 1.13.1. Obtain specialty permits related to project before start of Work.

1.14. Filing of Notice

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

HEALTH AND SAFETY FOR CONTAMINATED SITES**1.15. Health and Safety Plan**

- 1.15.1. Conduct a site-specific hazard assessment based on review of Contract, required Work, and project Site. Identify any known and potential health risks and safety hazards.
- 1.15.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - 1.15.2.1. Primary requirements:
 - 1.15.2.1.1. Contractor's safety policy.
 - 1.15.2.1.2. Identification of applicable compliance obligations.
 - 1.15.2.1.3. Definition of responsibilities for project safety/organization chart for project.
 - 1.15.2.1.4. General safety rules for project.
 - 1.15.2.1.5. Job-specific safe work procedures.
 - 1.15.2.1.6. Inspection policy and procedures.
 - 1.15.2.1.7. Incident reporting and investigation policy and procedures.
 - 1.15.2.1.8. Occupational Health and Safety Committee/Representative procedures.
 - 1.15.2.1.9. Occupational Health and Safety meetings.
 - 1.15.2.1.10. Occupational Health and Safety communications and record keeping procedures.
 - 1.15.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.
 - 1.15.2.3. List hazardous materials to be brought onsite as required by Work.
 - 1.15.2.4. Indicate engineering and administrative control measures to be implemented at the Site for managing identified risks and hazards.
 - 1.15.2.5. Identify personal protective equipment (PPE) to be used by workers.
 - 1.15.2.6. Identify personnel and alternates responsible for site safety and health.
 - 1.15.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.
- 1.15.3. 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.
- 1.15.4. Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
- 1.15.5. Departmental Representative's review: the review of Health and Safety Plan by Public Service and Procurement Canada (PWGSC) will not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract.

1.16. Emergency Procedures

- 1.16.1. 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:

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.16.1.1. Designated personnel from own company.
- 1.16.1.2. Regulatory agencies applicable to Work and as per legislated regulations.
- 1.16.1.3. Local emergency resources.
- 1.16.1.4. Departmental Representative and site staff.
- 1.16.2. Include the following provisions in the emergency procedures:
 - 1.16.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - 1.16.2.2. Evacuate all workers safely.
 - 1.16.2.3. Check and confirm the safe evacuation of all workers.
 - 1.16.2.4. Notify the fire department or other emergency responders.
 - 1.16.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - 1.16.2.6. Notify Departmental Representative and Site staff.
- 1.16.3. Provide written rescue/evacuation procedures as required for, but not limited to:
 - 1.16.3.1. Work at high angles.
 - 1.16.3.2. Work in confined spaces or where there is a risk of entrapment.
 - 1.16.3.3. Work with hazardous substances.
 - 1.16.3.4. Underground work.
 - 1.16.3.5. Work on, over, under and adjacent to water.
 - 1.16.3.6. Workplaces where there are persons who require physical assistance to be moved.
- 1.16.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
- 1.16.5. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.17. Hazardous Products

- 1.17.1. Comply with requirements of Workplace Hazardous Materials Information System 2015 (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
- 1.17.2. Where use of hazardous and toxic products cannot be avoided:
 - 1.17.2.1. Notify Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS 2015 documents as required.
 - 1.17.2.2. Provide adequate means of ventilation as required.

1.18. Unforeseen Hazards

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

1.19. Posted Documents

- 1.19.1. Post legible versions of the following documents onsite:
 - 1.19.1.1. Health and Safety Plan.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.19.1.2. Sequence of Work.
- 1.19.1.3. Emergency procedures.
- 1.19.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
- 1.19.1.5. Notice of Project.
- 1.19.1.6. Floor plans or Site plans.
- 1.19.1.7. Notice as to where a copy of the *Workers Compensation Act* and Regulations are available on the Site for review by employees and workers.
- 1.19.1.8. Workplace Hazardous Materials Information System 2015 (WHMIS 2015) documents.
- 1.19.1.9. Material Safety Data Sheets (MSDS).
- 1.19.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- 1.19.2. Post all Material Safety Data Sheets (MSDS) onsite, in a common area, visible to all workers and in locations accessible to tenants when Work of this Contract includes construction activities adjacent to occupied areas.
- 1.19.3. Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as accepted by the Departmental Representative.

1.20. Meetings

- 1.20.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
- 1.20.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
 - 1.20.2.1. Sign-in of all attendees.
 - 1.20.2.2. Planned Work activities and environmental considerations for that shift.
 - 1.20.2.3. Hazards associated with these Work activities, including environmental hazards (e.g. potential for hypothermia, heat exhaustion, heat stroke).
 - 1.20.2.4. Appropriate job-specific safe work procedures.
 - 1.20.2.5. Required personal protective equipment (PPE).
 - 1.20.2.6. Appropriate emergency procedures.
 - 1.20.2.7. Review recent accidents on Site, including near misses.
- 1.20.3. 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.

1.21. Correction of Non-Compliance

- 1.21.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
- 1.21.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

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- 1.21.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time.
- 1.21.4. Correct non-compliance.

1.22. Hazardous Occurrence Investigation and Reporting**1.22.1. Hazard includes:**

1.22.1.1. 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.

1.22.2. Hazardous Occurrence includes:

1.22.2.1. 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.

1.22.3. Hazardous Occurrence Investigation and Reporting Procedures:

1.22.3.1. Includes information regarding the person involved and the basic circumstances surrounding the hazardous occurrence.

1.22.3.2. Provides a detailed and thorough description of the hazardous occurrence and the sequence of events.

1.22.3.3. Indicates corrective measures that have been taken since the occurrence.

1.22.3.4. Requires the appointment of a qualified investigator.

1.22.3.5. Provides recommendations for additional corrective measures, if required.

1.22.4. Fatal or Serious Accidents Procedures:

1.22.4.1. Call emergency number to advise the police organization having jurisdiction to secure the scene and investigate the matter.

1.22.4.2. Advise the Departmental Representative of the fatality or serious accident within 1 hour.

1.22.4.3. No investigation will be conducted at the scene until the police service having jurisdiction has released the scene.

1.22.4.4. 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.

1.23. Utility Clearance

- 1.23.1. Contractor is solely responsible for utility clearance.
- 1.23.2. Contractor will not rely upon Drawings or other information provided with utility locations.

1.24. Personal Protective Equipment Program

- 1.24.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing as appropriate:
 - 1.24.1.1. Donning and doffing procedures.
 - 1.24.1.2. PPE selection based upon Site hazards.
 - 1.24.1.3. PPE use and limitations of equipment.
 - 1.24.1.4. Work mission duration, PPE maintenance and storage.
 - 1.24.1.5. PPE decontamination and disposal.
 - 1.24.1.6. PPE inspection procedures prior to, during, and after use.
 - 1.24.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.
 - 1.24.1.8. Medical surveillance requirements for personnel assigned to work at Site.
 - 1.24.1.9. 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.
 - 1.24.1.10. 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.
 - 1.24.1.11. Decontamination procedures for both personnel and equipment.
 - 1.24.1.12. 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.
 - 1.24.1.13. Written respiratory protection program for project activities.
 - 1.24.1.14. Procedures dealing with heat and/or cold stress.
 - 1.24.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

HEALTH AND SAFETY FOR CONTAMINATED SITES**1.25. Offsite Contingency and Emergency Response Plan**

- 1.25.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.
- 1.25.2. 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.

1.26. Personnel Health, Safety, and Hygiene

- 1.26.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
- 1.26.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.
- 1.26.3. Personal Protective Equipment:
 - 1.26.3.1. Ensure all site personnel are furnished with appropriate PPE.
 - 1.26.3.2. Unless identified otherwise in site-specific health and safety plan, minimum PPE to include: industrial protective headwear, high-visibility safety apparel, and protective footwear.
 - 1.26.3.3. Ensure that safety equipment and protective clothing is kept clean and maintained.
- 1.26.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
 - 1.26.4.1. Ensure industrial protective headwear is of appropriate CSA Standard and meets other appropriate standards.
 - 1.26.4.2. Ensure high-visibility safety apparel is of appropriate CSA Standard and meets other appropriate standards.
 - 1.26.4.3. Ensure protective footwear is of appropriate CSA Standard and meets other appropriate standards.
 - 1.26.4.4. Dispose of or decontaminate PPE worn onsite at end of each workday.
 - 1.26.4.5. Decontaminate reusable PPE before reissuing.
 - 1.26.4.6. Ensure site personnel have passed respirator fit test prior to entering potentially volatile contaminated work areas, as appropriate.
 - 1.26.4.7. Ensure facial hair does not interfere with proper respirator fit.
- 1.26.5. Respiratory Protection:
 - 1.26.5.1. 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.
 - 1.26.5.2. Develop, implement, and maintain respirator program.
 - 1.26.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.
 - 1.26.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.

HEALTH AND SAFETY FOR CONTAMINATED SITES

- 1.26.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.
- 1.26.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.
- 1.26.5.7. 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.
- 1.26.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- 1.26.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
 - 1.26.7.1. Suitable containers for storage and disposal of used disposable PPE.
 - 1.26.7.2. Potable water and suitable sanitation facility.
- 1.26.8. Emergency and First-Aid Equipment:
 - 1.26.8.1. 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.
- 1.26.9. Site Communications:
 - 1.26.9.1. Identify, supply and implement appropriate dedicated communication devices for Site and post emergency numbers near dedicated devices.
 - 1.26.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
 - 1.26.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
 - 1.26.9.4. Furnish selected personnel with 2-way radios.
 - 1.26.9.5. Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

2. PART 2 - PRODUCTS**2.1. Not Used**

- 2.1.1. Not Used.

3. PART 3 - EXECUTION**3.1. Not Used**

- 3.1.1. Not Used.

END OF SECTION

ENVIRONMENTAL PROCEDURES**1. PART 1 - GENERAL****1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

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. Names and qualifications of persons responsible for ensuring adherence to Environmental Protection Plan.

1.3.1.4. Names and qualifications of persons responsible for manifesting material to be removed from Site.

1.3.1.5. Names and qualifications of persons responsible for training Site personnel.

1.3.1.6. Description of Environmental Protection personnel training program.

1.3.1.7. Work Area Plan showing proposed activity in each portion of areas, such as exclusion zone(s), decontamination zone(s) and clean zone(s), fueling areas, 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.

1.3.1.8. 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.

1.3.1.9. Historical, Archaeological, Cultural Resources, Biological Resources and Wetlands Plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands. Include procedures if previously unknown historical, archaeological, cultural, and biological resources are discovered during Work.

1.3.1.10. Contamination Prevention Plan identifying hazardous, deleterious or regulated substances to be used onsite; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with federal, territorial, and municipal laws and regulations for storage and handling of these materials.

ENVIRONMENTAL PROCEDURES

- 1.3.1.11. Spill Control Plan including procedures, instructions, and reports to be used in event of spill of hazardous, deleterious or regulated substances. Identify locations and contents of spill kits.
- 1.3.1.12. Communications Plan 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.
- 1.3.1.13. Non-Contaminated Material Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Landfill Facility.
- 1.3.1.14. Wastewater Management Plan identifying methods and procedures for management and discharge of Contaminated and Non-Contaminated Water including surface waters and wastewater which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of groundwater, disinfection water, hydrostatic test water, and water used in flushing of lines. Include method of treatment and disposal.
- 1.3.1.15. Wastewater Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with Municipal zoning and bylaws of Disposal Facility and/or copy of municipal permit to discharge to sewer system
- 1.3.1.16. Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, federal, territorial, and municipal laws and regulations.
- 1.3.2. Pollution Control Procedures Modification: immediately when pollution control procedures are inadequate, as directed by the Departmental Representative, Submit modified procedures to resolve problem.
- 1.3.3. Pollution Control Remediation: immediately when soil, sediment or water is contaminated by Contractor's activities are inadequate as directed by the Departmental Representative, Submit remediation procedures.

1.4. Fires

- 1.4.1. Fires and burning of rubbish onsite not permitted.

1.5. Cleaning

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

ENVIRONMENTAL PROCEDURES

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 and after Final Completion of Work.

1.6. Site Clearing and Plant Protection

1.6.1. Minimize stripping of Topsoil and vegetation.

1.6.2. Restrict tree and plant removal to areas in accordance with the Contract or as directed by the Departmental Representative. 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.

1.7. Vibration

1.7.1. Maintain acceptable vibration levels 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.

1.8. Noise

1.8.1. Maintain acceptable noise levels not injurious to public health or safety or to the environment.

1.9. Maintenance of Public Roads

1.9.1. Prevent tracking or spilling of debris or material onto public roads.

1.9.2. Immediately sweep or scrape up debris or material on public roads.

1.9.3. Clean public roads within a 200 m radius of the Site entrance at least once per shift.

1.10. Pollution Control

1.10.1. 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.

1.10.2. Provide sequence, methods and means, and facilities to prevent spills or releases.

1.10.2.1. Maintain temporary erosion and pollution control features.

1.10.2.2. Do not store fuel onsite other than tanks forming part of the equipment.

1.10.2.3. Control emissions from equipment and plant to meet applicable authorities' emission requirements.

ENVIRONMENTAL PROCEDURES

- 1.10.2.4. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.
- 1.10.3. Inadequate procedures:
 - 1.10.3.1. Stop relevant Work if procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract.
 - 1.10.3.2. Submit procedures proposed to resolve problem.
 - 1.10.3.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause spills or other releases.
 - 1.10.3.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated quantities or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
- 1.10.4. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.
- 1.10.5. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.
 - 1.10.5.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.
 - 1.10.5.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.
 - 1.10.5.3. Spill kits are to be in close proximity to machinery.
 - 1.10.5.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.
- 1.10.6. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- 1.10.7. Promptly report spills and releases potentially causing damage to environment to:
 - 1.10.7.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - 1.10.7.2. Contractor emergency response team including Superintendent
 - 1.10.7.3. Departmental Representative and other contractor(s) and individuals as directed by the Departmental Representative.
- 1.10.8. 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.
- 1.10.9. Remediation of soil, sediment or water contaminated by Contractor's activities.
 - 1.10.9.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.

ENVIRONMENTAL PROCEDURES

- 1.10.9.2. 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.
- 1.10.9.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.
- 1.10.9.4. Remediate as directed by the Departmental Representative.
- 1.10.9.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.

1.11. Dust and Particulate Control

- 1.11.1. Execute Work by methods to minimize raising dust from construction operations.
- 1.11.2. Prevent fugitive dust from the Site from interfering with onsite and offsite uses.
- 1.11.3. Prevent dust from spreading to neighbouring properties.
- 1.11.4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, excavations, and stockpiles.
- 1.11.5. Implement and maintain dust and particulate control measures immediately as directed by the Departmental Representative during Work and in accordance with regulations and in accordance with the Contract.
- 1.11.6. Provide positive means to prevent airborne dust from dispersing into atmosphere. Use fresh (non-saline) water for dust and particulate control.
- 1.11.7. As minimum, use appropriate covers on vehicles, including trucks, barges, and trains, hauling fine or dusty material. Use watertight vehicles to haul wet materials.
- 1.11.8. Inadequate procedures:
 - 1.11.8.1. Stop relevant Work if dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract.
 - 1.11.8.2. Submit procedures proposed to resolve problem.
 - 1.11.8.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause release of dusts or particulates.
 - 1.11.8.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent release of dusts or particulates, or when monitoring indicates that dust or particulate 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. Non-Contaminated Material Removal

- 1.12.1. Remove all Non-Contaminated Material within Work areas in accordance with the Contract and as directed by the Departmental Representative.
- 1.12.2. Remove surplus materials and temporary facilities from Site.

ENVIRONMENTAL PROCEDURES

- 1.12.3. Dispose waste offsite.
- 1.12.4. Do not burn or bury any waste onsite.
- 1.12.5. Do not discharge wastes into streams or waterways.
- 1.12.6. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

1.13. Sewage Wastewater

- 1.13.1. Store Sewage Wastewater from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.
- 1.13.2. Provide, operate, and maintain Sewage Wastewater storage tanks to store Sewage Wastewater.
- 1.13.3. Transport and dispose of Sewage Wastewater at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.
- 1.13.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage Wastewater 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 Wastewater.

1.14. Wastewater Control

- 1.14.1. Dewater various parts of Work including, without limitation, excavations, structures, foundations, and Work areas.
- 1.14.2. Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
- 1.14.3. Direct surface waters that have not contacted potentially Contaminated Materials to surface drainage systems.
- 1.14.4. 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.

1.15. Non-Contaminated Water Disposal

- 1.15.1. Dispose of Non-Contaminated Water 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.
- 1.15.2. Control disposal or runoff of Non-Contaminated Water containing suspended materials or other harmful substances in accordance with local authority requirements.
- 1.15.3. Ensure pumped Non-Contaminated Water 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
- 1.15.4. Obtain permits to discharge Non-Contaminated Water to environment or Municipal sewers.

ENVIRONMENTAL PROCEDURES

1.15.5. Do not discharge water which may have come in contact with potentially Contaminated Material or otherwise be Contaminated directly offsite to the environment or to municipal sewers.

1.16. Erosion and Sediment Control

1.16.1. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other Work areas. Prevent erosion and sedimentation.

1.16.2. Minimize amount of bare soil or sediment exposed at one time. Stabilize disturbed soil or sediment as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by the Departmental Representative.

1.16.3. Provide and maintain temporary erosion and sediment control measures.

1.16.3.1. Temporary erosion and sediment control measures are required to prevent erosion and migration of silt, mud, sediment, and other debris offsite or to other areas of Site where damage might result, or that might otherwise be required by laws and regulations.

1.16.3.2. Temporary erosion and sediment control measures include: silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, dikes, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition.

1.16.3.3. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by the Departmental Representative

1.16.3.4. Place silt fences and/or hay or straw bales in ditches to prevent sediment from escaping from ditch terminations.

1.16.3.5. Do not construct bale barriers and silt fence in flowing streams or in swales.

1.16.3.6. Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

1.16.3.7. Bales and/or silt fence can be removed at beginning of Working Day, replace at end of Working Day.

1.16.3.8. Repair damaged bales, end runs, and undercutting beneath bales.

1.16.3.9. Unless directed by the Departmental Representative, remove temporary erosion and sediment control devices upon Final Completion of Work. Temporary erosion and sediment control devices once removed become property of Contractor.

1.16.4. Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

1.16.5. Construct fill areas to prevent erosion.

ENVIRONMENTAL PROCEDURES

- 1.16.6. Do not disturb existing embankments or embankment protection in accordance with the Contract.
- 1.16.7. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- 1.16.8. If soil, sediment and debris from Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where it is undesirable, remove accumulation and restore area to original condition, as directed by the Departmental Representative.

1.17. Work In or Adjacent to Waterways**1.17.1. Approvals and Practices:**

- 1.17.1.1. Obtain Discharge Approval prior to commencing work which may impact waterways.
- 1.17.1.2. Environmental Protection Requirements install and maintain a floating silt curtain, and a floating hydrocarbon booms around the active barrel removal recovery in case of inadvertent release of barrel contents. Barrels must always be handled on a liner 6 mil poly with leachate collection or other containment area in case of contents leakage when out of the water.
- 1.17.1.3. If applicable and as required, comply with *Fisheries Act* Authorization and other relevant authorizations and in accordance with the Contract.
- 1.17.1.4. Follow practices described in Fisheries and Oceans Canada (September 1993) Land Development Guidelines for the Protection of Aquatic Habitat.
- 1.17.1.5. Follow Best Practices for Instream Works.

1.17.2. Timing

- 1.17.2.1. 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.
- 1.17.2.2. Minimize duration of in-water work.
- 1.17.2.3. 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.
- 1.17.2.4. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

1.17.3. Site Selection

- 1.17.3.1. 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.
- 1.17.3.2. Design and construct approaches to wetland and waterbody such that they are perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- 1.17.3.3. 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.

ENVIRONMENTAL PROCEDURES

- 1.17.3.4. 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.
- 1.17.4. Contaminant and Spill Management
 - 1.17.4.1. 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.
 - 1.17.4.2. Develop a response plan and implement immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- 1.17.5. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- 1.17.6. Erosion and Sediment Control
 - 1.17.6.1. Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the wetlands or waterbodies during all phases of the project. Maintain erosion and sediment control measures until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the wetland or waterbody or settling basin and runoff water is clear.
- 1.17.7. Erosion and Sediment Control Plan includes:
 - 1.17.7.1. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - 1.17.7.2. Measures for managing 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. This includes pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - 1.17.7.3. 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).
 - 1.17.7.4. Measures for containing and stabilizing 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.
 - 1.17.7.5. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
 - 1.17.7.6. Repairs to erosion and sediment control measures and structures if damage occurs.
 - 1.17.7.7. Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
 - 1.17.7.8. Clearing of riparian vegetation should be kept to a minimum: use existing
 - 1.17.7.9. Remove all construction materials from site upon project completion.
- 1.17.8. Operation of Machinery

ENVIRONMENTAL PROCEDURES

- 1.17.8.1. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
- 1.17.8.2. 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.
- 1.17.8.3.
- 1.17.8.4. 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

1.18. Noncompliance

- 1.18.1. Departmental Representative will inform Contractor in writing of observed noncompliance with federal, territorial or municipal environmental laws, regulations, permits, or other environmental procedure violations.
- 1.18.2. After receipt of notice, inform the Departmental Representative of the proposed corrective action. Corrective action will be subject to acceptance of Departmental Representative.
 - 1.18.2.1. Do not take action until after receipt of written acceptance.
- 1.18.3. Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

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

REGULATORY REQUIREMENTS**1. PART 1 - GENERAL****1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. 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.

1.4. Laws, Regulations, Permits

1.4.1. Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.

1.4.2. 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.

1.4.3. Comply with certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have already been obtained.

1.4.4. Obtain and pay for certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work that have not already been obtained or that are required to be amended.

1.4.5. Provide applicable authorities with plans and information required for issue of acceptance certificates.

1.4.6. Furnish inspection certificates in evidence that the Work installed conforms with the requirements of the authority having jurisdiction.

1.5. Codes, Bylaws, Standards

1.5.1. Meet or exceed requirements of Contract, standards, and codes applicable to the performance of the Work and referenced documents.

1.5.2. In any case of conflict or discrepancy, the most stringent requirements will apply.

1.5.3. Perform Work in accordance with the National Building Code of Canada (NBC), and other requirements or codes in accordance with the Contract, construction

REGULATORY REQUIREMENTS

standards and/or any other code or bylaw applicable to the performance of the Work.

- 1.5.4. Certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial, territorial or municipal authorities to complete the Work: see 01 11 00.
- 1.5.5. Comply with all attachments, references, and reports relevant to Work, including environmental protection.

1.6. Smoking Environment

- 1.6.1. Smoking on the Site is not permitted.

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. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Inspection and Test Reports: within 5 Working Days of receipt, Submit 2 copies of inspection and test reports to Departmental Representative.

1.4. Quality of Work

1.4.1. Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman, or Qualified Professional.

1.4.2. Meet or exceed standards set out in the National Building Code of Canada as applicable for workmanship, erection methods and procedures.

1.4.3. In cases of dispute, perform Work to standard or quality in accordance with any decisions by the Departmental Representative.

1.4.4. Follow Departmental Representative's directions to meet the Quality of Work in accordance with the Contract at no increase to the Contract Amount and no increase to Extension of Time for completion of the Work. Quality of Work includes addressing comments on Submittals, modifying environmental procedures, and preventing or remediating contaminated material spills.

1.5. Quality Management

1.5.1. Be responsible for all Quality Assurance and Quality Control during the performance of the Work.

1.5.2. Quality Assurance and Quality Control includes monitoring, inspecting, testing, documenting and reporting the means, methods, materials, workmanship, processes, and products of all aspects of the Work, including design, construction, and management as necessary to ensure conformance with the Contract.

1.5.3. Assist Departmental Representative in quality audit inspections and submit all indicated information within 5 Working Days of collection or as directed.

1.6. Inspection

1.6.1. 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 Transportation (e.g. transfer stations), Treatment, and Disposal Facilities.

1.6.2. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative directions, or law of Site.

QUALITY CONTROL

- 1.6.3. 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.
- 1.6.4. Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.7. Independent Inspection Agencies

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

1.8. Access to Work

- 1.8.1. Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- 1.8.2. Co-operate to provide reasonable facilities for such access.

1.9. Procedures

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

1.10. Rejected Work

- 1.10.1. Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- 1.10.2. Make good other Contractor's work damaged by such removals or replacements promptly.

1.10.3. If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, PWGSC will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.11. Reports

1.11.1. Provide copies of inspection and test reports to subcontractor of work being inspected or tested.

1.12. Tests and Mix Designs

1.12.1. Furnish test results and mix designs as requested.

1.12.2. Test results must be signed by Qualified Professional.

1.12.3. The Departmental Representative may require, and pay for, additional inspection and testing services not included above.

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

CONSTRUCTION FACILITIES

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

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

1.3.1.3. Equipment and material staging areas.

1.3.1.4. Barrel and other waste containment laydown area, including methods used to contain and collect water, barrel contents, runoff including design characteristics including liner thickness (if required) etc;

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. Location of all temporary facilities including: decontamination units, office trailers, , parking, storage, environmental monitoring stations, above ground and underground utilities, and temporary facilities and roads.

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

1.4. Utilities

1.4.1. Utilities 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

1.5. Fire Protection

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

1.6. Access and Delivery

1.6.1. Only the designated entrance in accordance with the Contract can be used for access to Site.

1.6.1.1. Maintain for duration of Contract.

1.6.1.2. Make good damage resulting from Contractor's use.

1.6.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

CONSTRUCTION FACILITIES

1.7. Installation and Removal

- 1.7.1. 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.
- 1.7.2. Identify areas which have to be graveled or otherwise treated to prevent tracking of mud.
- 1.7.3. Indicate use of supplemental or other staging area.
- 1.7.4. Provide construction facilities in order to execute work expeditiously.
- 1.7.5. Provide temporary utilities in order to execute Work expeditiously.
- 1.7.6. Remove from Site all such Work after use.

1.8. Site Storage/Loading

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

1.9. Construction Parking

- 1.9.1. Parking of on Site as directed by Departmental Representative and/or Airport Manager.
- 1.9.2. Provide and maintain adequate access to project site.

1.10. Security

- 1.10.1. Be responsible security of site and contents of site after working hours and during holidays.
- 1.10.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative

1.11. Equipment, Tools and Materials Storage

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

1.12. Sanitary Facilities

- 1.12.1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- 1.12.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- 1.12.3.

CONSTRUCTION FACILITIES

1.13. Clean-Up

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

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

PRODUCT REQUIREMENTS**1. PART 1 - GENERAL****1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Product Data: at least 5 Working Days prior to use, Submit data on products to be used in Work. Include:

1.3.1.1. Manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other information in accordance with the Contract.

1.3.1.2. Delete information not applicable to project.

1.3.1.3. Supplement standard information to provide details applicable to project.

1.3.1.4. Cross-reference product data information to applicable portions of Contract.

1.3.2. Substitution: at least 5 Working Days prior to use and after Contract award, Submit proposals for substituting products, if required. Include statements of respective costs of items originally in accordance with the Contract and the proposed substitution.

1.3.3. Quality of Work: at least 5 Working Days prior to Work, Submit alternate means to meet or correct quality of work, if required.

1.4. Products, Material and Equipment

1.4.1. Use new products, material and equipment in accordance with the Contract. The term "products" is referred to throughout the specifications.

1.4.2. Use products of one manufacturer for material and equipment of the same type or classification in accordance with the Contract.

1.4.3. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation method in accordance with the Contract s.

1.4.4. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document must be followed.

1.4.5. Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

1.4.6. Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from Site.

1.4.7. Store products in accordance with Suppliers' instructions.

1.5. Quality of Products

1.5.1. Products, materials and equipment (referred to as products) incorporated into Work must be new, not damaged or defective, and of the best quality

PRODUCT REQUIREMENTS

(compatible with the specifications) for the purpose intended. As directed by the Departmental Representative, furnish evidence as to type, source, and quality of the products provided.

- 1.5.2. Defective products will be rejected regardless of previous inspections.
 - 1.5.2.1. Inspection does not relieve responsibility, but is precaution against oversight or error.
 - 1.5.2.2. Remove and replace defective products.
- 1.5.3. Retain purchase orders, invoices and other documents to prove that all products utilized in the Work meet the requirements of the Contract. Produce documents as directed by the Departmental Representative.
- 1.5.4. Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative in accordance with the Contract.
- 1.5.5. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.6. Availability of Products

- 1.6.1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.
- 1.6.2. If delays in supply of products are foreseeable, Notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
- 1.6.3. In event of failure to Notify Departmental Representative at the start of Work and should it subsequently appear that the Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character.

1.7. Manufacturer's Instructions

- 1.7.1. Install or erect products in accordance with the manufacturer's instructions in accordance with the Contract.
 - 1.7.1.1. Do not rely on labels or enclosures provided with products.
 - 1.7.1.2. Obtain written instructions directly from the manufacturer.
- 1.7.2. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document must be followed.
- 1.7.3. Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to instruct the removal and re-installation.

1.8. Contractor's Options for Selection of Products for Tendering

- 1.8.1. Products specified by "Prescriptive" specifications: select any product meeting or exceeding requirements in accordance with the Contract.
- 1.8.2. Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

PRODUCT REQUIREMENTS

- 1.8.3. Products specified to meet particular design requirements or to match existing materials: use only material in accordance with the Contract.
- 1.8.4. When products are specified by a referenced standard or by performance specifications, as directed by the Departmental Representative obtain from manufacturer and independent laboratory report showing that the product meets or exceeds the requirements in accordance with the Contract.

1.9. Storage, Handling and Protection

- 1.9.1. Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
- 1.9.2. Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.
- 1.9.3. Store products subject to damage from weather in weatherproof enclosures.
- 1.9.4. Remove and replace damaged products as directed by the Departmental Representative.

1.10. Transportation

- 1.10.1. Pay costs of transportation of products required in performance of Work.
- 1.10.2. Transport products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- 1.10.3. Transport products subject to damage from weather in weatherproof enclosures.
- 1.10.4. Transport in an efficient manner that does not cause delays to the Work schedule.

1.11. Quality of Work

- 1.11.1. Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately Notify Departmental Representative if required Work is such as to make it impractical to produce results in accordance with the Contract. Provide alternate means to meet or correct quality of work, as accepted by the Departmental Representative.
- 1.11.2. Do not employ anyone unskilled in their required duties.
- 1.11.3. Perform Work to standard of fitness of Quality of Work in accordance with any decision by the Departmental Representative.

1.12. Coordination

- 1.12.1. Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

1.13. Remedial Work

- 1.13.1. Perform remedial Work required to repair or replace parts or portions of Work as directed by the Departmental Representative as defective or unacceptable. Coordinate adjacent affected Work as required.

PRODUCT REQUIREMENTS

- 1.13.2. Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.14. Storage Tanks

- 1.14.1. 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.
- 1.14.2. Temporary storage tanks subject to the regulations must be registered with Environment Canada.
- 1.14.3. Mobile tanks subject to the regulations must be certified to be mobile.
- 1.14.4. Storage tanks to meet the following minimum requirements:
- 1.14.4.1. Corrosion protection.
 - 1.14.4.2. Secondary containment.
 - 1.14.4.3. Containment sumps, if applicable.
 - 1.14.4.4. Overfill protection.
- 1.14.5. All components of tank system must bear certification marks indicating that they conform to the standards set out in the regulations.
- 1.14.6. Product transfer area must be designed to contain spills.
- 1.14.7. Prepare an emergency plan.
- 1.14.8. Prior to first filling, storage tanks must:
- 1.14.8.1. Be registered.
 - 1.14.8.2. Be certified and marked.
 - 1.14.8.3. Transfer area be constructed.
 - 1.14.8.4. Emergency plan in place.

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

WASTE MANAGEMENT AND DISPOSAL**1. PART 1 - GENERAL****1.1. Measurement Procedures**

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Waste Reduction Plan: within 10 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing material separation. Include:

1.3.1.1. List of materials to be reused or recycled.

1.3.1.2. Sequence, methods and means to dispose Waste offsite. For all Landfill Facilities include name of facility; location of facility; copy of valid and subsisting permit, certificate, approval, license, or other required form of authorization issued by a Facility Authority for the facility; and evidence of compliance with municipal zoning and bylaws of facility.

1.3.2. Landfill Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of material delivered to Landfill Facility. Include:

1.3.2.1. Issued by the Landfill 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 Landfill Facility.

1.3.3. Recycling Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of materials sent for recycling.

1.4. Waste Disposition

1.4.1. Waste and Non-Contaminated Material Disposal:

1.4.1.1. Dispose all soil and sediment in Landfill Facility.

1.4.1.2. Divert materials other than soil or sediment which can be practically reused or recycled from Landfill as approved by Departmental Representative.

1.4.1.3. All Waste not reused or recycled must be disposed in Landfill Facility.

1.5. Waste Transport

1.5.1. Assume ownership of, and be responsible for, Waste once it is loaded on a vehicle, barge, or other vessel for transport.

1.5.2. Transport material as soon as practical. Do not unreasonably stockpile material onsite.

1.5.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

WASTE MANAGEMENT AND DISPOSAL

- 1.5.4. Excess water in material must not be allowed to flow out of vehicle or vessel during transport.
- 1.5.5. Stabilize material as necessary.
- 1.5.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Waste.
- 1.5.7. Manifest and correlate quantities of all material transported from Site documenting quantity removed from Site, movement, transfer stations, interim storage and treatment, and weight of material at final Disposal Facility. Submit all manifests, as directed by the Departmental Representative.
- 1.5.8. Material transported with discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
 - 1.5.8.1. No manifest or an incomplete manifest.
 - 1.5.8.2. The material transported does not match the description in the manifest.
 - 1.5.8.3. The amount transported differs by more than 5% in the manifest.
 - 1.5.8.4. The material transported is in a hazardous condition.
- 1.5.9. Transfer/Interim Storage Facility must:
 - 1.5.9.1. Be an existing offsite facility located in Canada or the United States.
 - 1.5.9.2. Be designed, constructed and operated for the transfer or interim storage of Contaminated Material.
 - 1.5.9.3. 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.
 - 1.5.9.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.5.10. Facility Authority:
 - 1.5.10.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.5.10.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.5.10.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
 - 1.5.10.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.

1.6. Waste Disposal

- 1.6.1. Assume ownership of, and be responsible for, Waste disposed.
- 1.6.2. Waste Disposal: dispose Waste at Landfill Facility provided by Contractor and accepted by the Departmental Representative.
- 1.6.3. Disposal Facility must:
 - 1.6.3.1. Be an existing offsite facility located in Canada or the United States.

WASTE MANAGEMENT AND DISPOSAL

- 1.6.3.2. 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. Must conform with the Yukon Landfill Criteria for Solid Waste or equivalent requirements of authorities having jurisdiction.
- 1.6.3.3. 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.
- 1.6.3.4. Comply with applicable municipal zoning, bylaws, and other applicable requirements.
- 1.6.4. Facility Authority:
 - 1.6.4.1. For facilities within provincial or territorial jurisdiction: the relevant provincial or territorial ministry.
 - 1.6.4.2. For facilities on First Nations reserve land in Canada not subject to the First Nation Land Management regime: Indigenous and Northern Affairs Canada.
 - 1.6.4.3. For facilities on First Nations reserve land in Canada subject to the First Nation Land Management regime: the relevant First Nation Council. In addition, a Qualified Professional must certify that the facility is appropriate for the relevant Contaminated Material.
 - 1.6.4.4. For facilities in the United States of America: either or both of the Environmental Protection Agency and the relevant State, as appropriate.
- 1.6.5. 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.
- 1.6.6. Material sent to a Landfill Facility must be permanently stored at that facility.
- 1.6.7. If proposed Landfill Facility is not acceptable to Departmental Representative, provide an alternate Landfill Facility that is acceptable.
- 1.6.8. Submit Landfill Receipts for all Waste material disposed offsite.

1.7. Materials Source Separation

- 1.7.1. Provide separate containers for reusable and/or recyclable Non-Contaminated Materials of the following:
 - 1.7.1.1. Metals.
 - 1.7.1.2. Wood.
 - 1.7.1.3. Plastics.
 - 1.7.1.4. Paper.
 - 1.7.1.5. Glass.
 - 1.7.1.6. Concrete.
 - 1.7.1.7. Other materials in accordance with the Contract.
- 1.7.2. Implement Materials Source Separation Program for waste generated on project in compliance with methods accepted by the Departmental Representative.
- 1.7.3. Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- 1.7.4. Locate separated materials in areas which minimize material damage.

WASTE MANAGEMENT AND DISPOSAL

1.8. Diversion of Materials

- 1.8.1. Create a list of materials to be separated from the general waste stream and stockpiled in separate containers, as accepted by the Departmental Representative and consistent with applicable fire regulations.
 - 1.8.1.1. Mark containers.
 - 1.8.1.2. Provide instruction on disposal practices.

1.9. Storage, Handling and Application for Recycling

- 1.9.1. Do Work in compliance with Waste Reduction Plan.
- 1.9.2. Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes, and dispose at Recycling Facility weekly.
- 1.9.3. Materials in separated condition: collect, handle, store onsite, and transport offsite to an authorized recycling facility accepted by the Departmental Representative, and remove from Site weekly.
- 1.9.4. Materials must be immediately separated into specified categories for reuse or recycling.
- 1.9.5. Unless otherwise in accordance with the Contract, materials for removal become the Contractor's property.
- 1.9.6. Onsite sale of salvaged/recyclable material is not permitted.
- 1.9.7. Submit receiving facility weigh scale receipts indicating quantity and type of materials sent for recycling as directed by the Departmental Representative.

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. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Product Instructions: at least 10 Working Days before Substantial Performance of the Work is completed, Submit instructions and data by personnel experienced in maintenance and operation of products and equipment constructed and remaining onsite, if required.

1.3.2. Closeout Documents: within 20 Working Days of Final Completion of Site Restoration, Submit completion documents and as-built documents.

1.4. As-Built Documents

1.4.1. The Departmental Representative will provide 2 sets of Drawings, 2 sets of Specifications, and 2 copies of the original AutoCAD files for "as-built" purposes.

1.4.2. 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.

1.4.3. Drawings and Shop Drawings: legibly mark each item to record actual construction, including:

1.4.3.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

1.4.3.2. Field changes of dimension and detail.

1.4.3.3. Changes made by change orders.

1.4.3.4. Details not on original Drawings.

1.4.3.5. References to related Shop Drawings and modifications.

1.4.4. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:

1.4.4.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

1.4.4.2. Changes made by addenda and change orders.

1.4.5. As-built information:

1.4.5.1. Record changes in red ink.

1.4.5.2. 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.

1.4.5.3. Submit 1 set in editable AutoCAD 14 file format with all as-built information.

1.4.5.4. Submit all sets as directed by the Departmental Representative.

CLOSEOUT SUBMITTALS

- 1.4.6. As required, surveying to be completed by a Land Surveyor for as-built documents.

1.5. Completion Documents

- 1.5.1. Submit as directed by the Departmental Representative, a written certificate that the following have been performed:
 - 1.5.1.1. Work has been completed and inspected by the Departmental Representative in accordance with the Contract.
 - 1.5.1.2. Treatment and disposal of treatable soils have been completed and disposal of all other soils has been completed.
 - 1.5.1.3. 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.
 - 1.5.1.4. Equipment and systems have been tested, adjusted and balanced, and are fully operational, as applicable.
 - 1.5.1.5. Certificates required by the Fire Commissioner of Canada, and utility companies have been submitted, as applicable.
 - 1.5.1.6. Operation of systems has been demonstrated to the personnel as directed by the Departmental Representative, as applicable.
 - 1.5.1.7. Qualified Professional report documenting backfilling has met all requirements of the Contract.
 - 1.5.1.8. Work is complete and ready for Final Site Inspection.
- 1.5.2. Defective products will be rejected, regardless of previous inspections. Replace defective products.
- 1.5.3. 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

EXCAVATION, TRENCHING AND BACKFILL

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Onsite Access Roads

1.3.1. Maintain onsite access roads as follows:

1.3.1.1. Obtain permission to use existing onsite access roads.

1.3.1.2. Maintain and clean roads for duration of Work.

1.3.1.3. Control mud and dust from road.

1.3.1.4. Repair damage incurred from use of roads.

1.3.1.5. Provide photographic documentation of roads used by construction vehicles before, during and after Work.

1.3.1.6. The Departmental Representative can instruct cleaning of the onsite access roads.

2. PART 3 - EXECUTION

2.1. Examination

2.1.1. Site Verification of Conditions:

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

3.2. Mobilization Requirements

3.2.1. Do not mobilize until directed by Departmental Representative.

3.2.2. Mobilize all necessary equipment, materials and personnel to the Site in an orderly and efficient manner.

3.3. Site Preparation and Operation

3.3.1. Site Preparation and operation includes construction, operation and maintenance for the duration of the Work,

3.3.2. Remove and dispose all surficial Non-Contaminated Material at a Landfill to allow access for Work.

3.3.3. Clearing and grubbing of the Site to allow access for Work.

3.3.3.1. Clearing consists of removing Non-Contaminated Material 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 Material at a Landfill.

EXCAVATION, TRENCHING AND BACKFILL

- 3.3.3.2. Grubbing consists of excavation of Non-Contaminated Material below existing ground surface to facilitate Work. Includes: stumps, roots, boulders and rock fragments. Dispose of Non-Contaminated Material at a Landfill.
- 3.3.4. Remove obstructions, ice and snow, from surfaces to be worked.
- 3.3.5.
- 3.3.6. Protection:
 - 3.3.6.1. Protect existing features with temporary barriers and enclosures as required by applicable local regulations.
 - 3.3.6.2.
 - 3.3.6.3. Protect natural and man-made features required to remain undisturbed. Unless otherwise required or located in an area to be occupied by new construction, protect existing trees from damage.
 - 3.3.6.4. Protect buried utilities that are required to remain undisturbed.
 - 3.3.6.5. Provide temporary structures to divert flow of surface water from excavation.
- 3.3.7. Security and Safety:
 - 3.3.7.1. Provide safety measures to ensure worker and public safety.
 - 3.3.7.2. Ensure Site is secure during onsite Work, provide, install, and remove fencing, temporary hoarding, and other security measures as required and specified.
- 3.3.8. Site including all restoration and excavation areas should be secured with locked fencing, temporary hoarding and security personnel as required.

3.4. Site Restoration

- 3.4.1. Final site grades must be within 5 cm of pre-existing grades before Work commenced, unless otherwise specified.
- 3.4.2. Re-establish pre-existing drainage, unless otherwise specified.
- 3.4.3. Clean permanent access roads of contamination resulting from project activity as required or as directed of Departmental Representative, with no increases to Contract Amount or Extension of Time for completion of the Work.
- 3.4.4. Decontaminate equipment used in construction processes and remove from Site at end of construction activities.
- 3.4.5. Remove all temporary structures including subsurface structures for shoring support.
- 3.4.6. Upon Final Completion of Work, remove Non-Contaminated Material and debris, trim slopes, and correct defects as directed by the Departmental Representative.
- 3.4.7. 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.
- 3.4.8. Reinstate pre-existing utilities, existing site access roads impacted by excavations and other infrastructure to original location and condition, meeting current standards, codes, and other requirements, unless otherwise indicated or as directed by the Departmental Representative.

EXCAVATION, TRENCHING AND BACKFILL

3.4.9. Reinstatement surface to pre-existing conditions, including surface material (e.g. vegetation, gravel, pavement), unless otherwise indicated or as directed by the Departmental Representative.

3.5. Demobilization

3.5.1. Do not demobilize until directed by Departmental Representative.

3.5.2. Demobilize all necessary equipment, materials, and personnel from Site in an orderly and efficient manner.

END OF SECTION

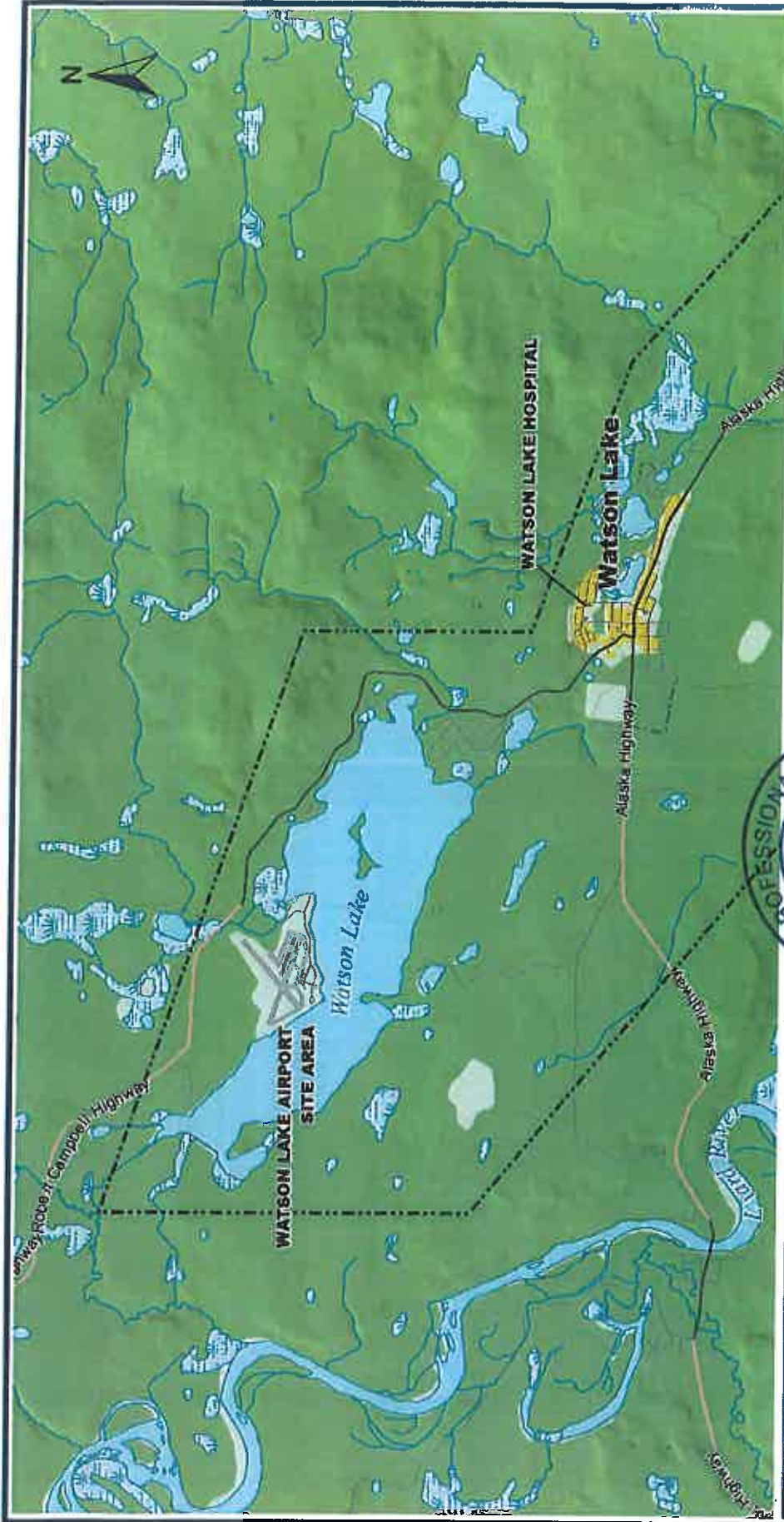
DRAWINGS



Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada

Canada

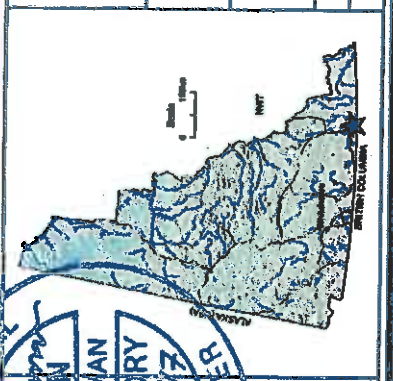


PUBLIC SERVICES AND PROCUREMENT
CANADA (PSPC)
WATSON LAKE AIRPORT
WATSON LAKE, YT

2017 AEC 5 REMEDIATION SPECIFICATION

SITE LOCATION

Date: September 7, 2017
 Project No. 205.03873.00000
 Drawing No. **1**



BASE DATA:
 © Department of Natural Resources Canada, All rights reserved; National Road Network, National Railway Network Geobase60, Downloaded March 2014; Waterbodies 50k, GeomaticsYukon, Downloaded August 2016; Watercourses 50k, GeomaticsYukon, Downloaded August 2016; Contours 50k, GeomaticsYukon, Downloaded August 2016;

- Contour (20m)
- - - Municipality Boundary
- Watercourse
- Wetland
- Building
- Wooded Area
- Developed Area
- Highway
- Arterial
- Local / Street
- Alleyway / Lane
- Resource / Recreation

SCALE 1:100,000
 WHEN PLOTTED CORRECTLY ON A 8.5 x 11 PAGE LAYOUT
 NAD 1983 UTM Zone 9 V

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

SLR
 global environmental solutions

NOTES:
 REFERENCED FROM FRONTIER GEOSCIENCE INC. BATHYMETRY, SBE-SCM
 SONAR AND MARETRONIC SURVEY REPORT, PROJECT F01-164
 WATSON LAKE AIRPORT, WATSON LAKE, YUKON TERRITORY, CANADA.
 EASTING: 498150.00, NORTHING: 6017000.00, DATUM: NAD 83, UTM ZONE 18
 Q, DATUM: WGS 84, ELLIPSOID: GRS 80, SPHEROID: GRS 80,
 GEMINATING: AUSTRALIA, IN: IGP, SPHEROID: AND THE 83rd COMMUNITY,
 ACCESSED FEBRUARY 2017

LEGEND:

 - - - WATSON LAKE AIRPORT BOUNDARY
 RESTRICTED AREA (WATSON OPERATIONS)



SCALE 1:7,200
 WHEN PLOTTED CORRECTLY ON A 11 X 17 PAPER LAYOUT
 AND YIELDING A 9 X 12 INCH LAYOUT
 THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL
 CONDITIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

PUBLIC SERVICES AND PROCUREMENT
 CANADA (PSPC)
 WATSON LAKE AIRPORT
 WATSON LAKE, YT

2017 AEC 5 REMEDIATION SPECIFICATION

SITE LAYOUT

Date: September 7, 2017 Drawing No. 2
 Project No. 206.03873.00000



NOTES:
 REFERENCED FROM FRONTIER GEOTECHNICAL INC. DATA METRIC, SITE SCAN
 REPORT, WATSON LAKE AIRPORT, PROJECT #2017-001, DATED
 SEPTEMBER 2016. NUMBER: 2017-001. DATE: 09/27/17
 EASTSTAR GEOGRAPHICS, CHEMISTS: MS. LISA, LUCAS, AEC
 SOFTWARE, AIRBORNE, LIDAR, SP. 5M/20M/10M, AND THE CBS COMMUNITY,
 ACCESS FEBRUARY 2017

LEGEND:
 WATSON LAKE AIRPORT BOUNDARY
 AEC 5 PROPOSED WORK AREA
 PROPOSED WORK AREA
 RESTRICTED AREA (WATSON OPERATIONS)



SCALE 1:7,500
 WHEN PLOTTED ON A 11x17 PAGE LAYOUT
 THIS DRAWING IS FOR INFORMATION ONLY. ACTUAL
 DIMENSIONS MAY VARY AND SHOULD BE VERIFIED ON SITE.

PUBLIC SERVICES AND PROCUREMENT
 CANADA (PSPC)
 WATSON LAKE AIRPORT
 WATSON LAKE, YT

2017 AEC 5 REMEDIATION SPECIFICATION

PROPOSED WORK AREAS

Date: September 7, 2017
 Drawing No. 3
 Project No. 205.03673.00000





NOTES:
 REFERENCED FROM FRONTIER GEOSCIENCE INC. BATHYMETRY, SIDE 1: 5M
 CONRAD AND MAGNETOMETER SURVEY REPORT, PROJECT FROM 14M
 (SEPTEMBER 2016). IMAGERY: ESRI, INC., DIGITAL GLOBE, GEODEY,
 INSTAR, GEOGRAPHIC 1, CHESTERBURG, DC, USGS, 1/7/98, AEC,
 GENTLEMAN, MN, BPT, 9/18/2010, AND THE GP COMMUNITY,
 ACCESS: 12 FEBRUARY 2017

- LEGEND:
- 1:5 M WORK AREA BOUNDARY
 - AEC 5 PRE-PROCESSED WORK AREA BOUNDARY
 - BATHYMETRIC ELEVATION CONTOUR
(5 m INTERVAL, 4)
 - BATHYMETRIC ELEVATION CONTOUR
(1 m INTERVAL)



SCALE: 1:5,000
 SHEET PLOTTED CORRECTLY ON A11 X 17 PAGE LAYOUT
 AND IS NOT TO BE USED FOR CONCEPTUAL PURPOSES ONLY. ACTUAL
 LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

PUBLIC SERVICES AND PROCUREMENT
CANADA (PSPC)
WATSON LAKE AIRPORT
WATSON LAKE, YT

2017 APEC 5 REMEDIATION SPECIFICATION

BATHYMETRY

Date: September 7, 2017 Drawing No.
 Project No. 205.03873.00000 4



NOTES:
 REFERENCED FROM FRONTIER GEOSCIENCE INC. BATHYMETRY, SUBSIDIARY
 SONAR AND MAGNETOMETER SURVEY REPORT, PROJECT F04-164
 WATSON LAKE AIRPORT, WATSON LAKE, Y.T. THE SONAR DATA WAS
 BATHYMETRIC GEOSPATIAL CORRELATIONS (SUN, USGS, CANADA,
 GERMANY, AERONAUTICAL, ICAO, IGP, BNSYSTOPS, AND THE GIB COMMUNITY,
 ACCESSED FEBRUARY 2017

LEGEND:
 WATSON LAKE AIRPORT BOUNDARY
 AEC 5 PROPOSED WORK AREA
 LOCATION OF OBJECT(S) TO BE REMOVED
 LOCATION OF MULTIPLE OBJECTS OVER A LARGE AREA TO BE REMOVED

ID	DESCRIPTION
2017-4214	Other object
2017-4215	1 barrel
2017-4216	1 barrel
2017-4217	Other object
2017-4200	1 barrel
2017-4201	1 barrel
2017-4202	3 barrels
2017-4203	1 barrel
2017-4204	1 barrel
2017-4205	1 barrel
2017-4206	Other object
2017-4207	1 barrel
2017-4208	Other object
2017-4209	1 barrel
2017-4210	4 barrels
2017-4211	5 barrels
2017-4212	2 barrels
2017-4213	1 barrel
2017-4214	1 barrel
2017-4215	Other object
2017-4216	1 barrel
2017-4217	1 barrel
2017-4218	1 barrel
2017-4219	1 barrel
2017-4220	1 barrel
2017-4221	1 barrel
2017-4222	1 barrel
2017-4223	1 barrel
2017-4224	1 barrel
2017-4225	1 barrel
2017-4226	1 barrel
2017-4227	1 barrel
2017-4228	1 barrel
2017-4229	1 barrel
2017-4230	1 barrel
2017-4231	1 barrel
2017-4232	1 barrel
2017-4233	1 barrel
2017-4234	1 barrel
2017-4235	1 barrel
2017-4236	1 barrel
2017-4237	1 barrel
2017-4238	1 barrel
2017-4239	1 barrel
2017-4240	1 barrel
2017-4241	1 barrel
2017-4242	1 barrel
2017-4243	1 barrel
2017-4244	1 barrel
2017-4245	1 barrel
2017-4246	1 barrel
2017-4247	1 barrel
2017-4248	1 barrel
2017-4249	1 barrel
2017-4250	1 barrel
2017-4251	1 barrel
2017-4252	1 barrel
2017-4253	1 barrel
2017-4254	1 barrel
2017-4255	1 barrel
2017-4256	1 barrel
2017-4257	1 barrel
2017-4258	1 barrel
2017-4259	1 barrel
2017-4260	1 barrel
2017-4261	1 barrel
2017-4262	1 barrel
2017-4263	1 barrel
2017-4264	1 barrel
2017-4265	1 barrel
2017-4266	1 barrel
2017-4267	1 barrel
2017-4268	1 barrel
2017-4269	1 barrel
2017-4270	1 barrel
2017-4271	1 barrel
2017-4272	1 barrel
2017-4273	1 barrel
2017-4274	1 barrel
2017-4275	1 barrel
2017-4276	1 barrel
2017-4277	1 barrel
2017-4278	1 barrel
2017-4279	1 barrel
2017-4280	1 barrel
2017-4281	1 barrel
2017-4282	1 barrel
2017-4283	1 barrel
2017-4284	1 barrel
2017-4285	1 barrel
2017-4286	1 barrel
2017-4287	1 barrel
2017-4288	1 barrel
2017-4289	1 barrel
2017-4290	1 barrel
2017-4291	1 barrel
2017-4292	1 barrel
2017-4293	1 barrel
2017-4294	1 barrel
2017-4295	1 barrel
2017-4296	1 barrel
2017-4297	1 barrel
2017-4298	1 barrel
2017-4299	1 barrel
2017-4300	1 barrel

SCALE 1:10,000
 W/MSK PLOTTED CORRECTLY ON A 11x17 PAGE LAYOUT
 THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL
 LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE BROWN.

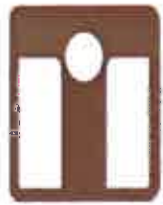
PUBLIC SERVICES AND PROCUREMENT
CANADA (PSPC)
WATSON LAKE AIRPORT
WATSON LAKE, YT
2017 AEC 5 REMEDIATION SPECIFICATION
BASE WORK - LOCATION OF OBJECTS
REQUIRING REMOVAL/DISPOSAL

Date: September 7, 2017
 Drawing No. 5
 Project No. 205.03873.00000



APPENDIX A
**Location, Quantity and Condition of Barrels and Other
Objects to be Removed from Watson Lake**

APPENDIX B
Diver Assessment of Underwater Barrel Conditions and
Locations (ITB Subsea, 2017)



ITB Subsea Ltd

ITB Marine Group

Barrel condition assessment
Watson lake airport
July 25th to 29th, 2017

SLR Project 205.03873.00000

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Introduction

From July 25th to 29th 2017 ITB Subsea Ltd carried out underwater inspections at specific coordinates along the shoreline of Watson lake airport for SLR consulting (Canada) Ltd. The objective was to determine the condition of the barrels, the quantity and whether they could be recovered. In addition to viewing the lake bed at the coordinates provided a limited survey was carried out along the length of the Watson Lake Airport water lot, multiple barrels and metal objects were sighted and recorded.

Equipment & procedure

The survey was carried out using surface supplied diving equipment with two way communications and live stream recordable video. All dive operations were carried out from a boat which was anchored at each location to be surveyed. Where appropriate live boating was performed to allow the diver to inspect multiple targets at a time, in this case each set of coordinates were marked using a weighted line and a float to mark the exact location. A measured line was used by the diver to perform circle searches around the marked coordinates, a minimum of 10m radius search was carried out. In locations where objects were found the radius was extended and further searches carried out – objects found further than 10m from the coordinates were recorded with new coordinates.

For areas with multiple objects in close proximity an area is marked between two sets of coordinates with a quantity and description of the objects located in the area.

Primary GPS unit used was a handheld Garmin etrex - high-sensitivity GPS receiver with GLONASS.
Secondary GPS unit used was a GPSmap 740s chart plotter with local map information installed.
Tertiary GPS unit was Polaris navigation software allowing for coordinates to be overlaid with satellite photography.

All three GPS resources were used in conjunction to confirm locations at each set of coordinates.

Findings

Previous coordinates, UTM zone 9v

Location	UTM Easting	UTM Northing	NUMBER OF BARRELS PRESENT	CONDITION OF BARRELS FOUND	LAKE BOTTOM SUBSTRAT?	OTHER OBJECTS	OTHER COMMENTS AND OBSERVATIONS
1	508782	6664856	0		150mm thick weed cover		2m deep
2	508849	6664701	0		Firm mud		8m deep
3	508947	6664587	0		Weed cover		3m deep
4	508938	6664578	0		Firm mud		7.5m deep
5	508952	6664536	0		Firm mud		8m deep
6	508972	6664483	0		Firm mud	Small log	8m deep
7	509005	6664493	0		300mm-450mm weed cover		2m deep
8	509068	6664374	0		Weed cover		2m deep
9	509079	6664350	0		Weed cover		2m deep
10	509107	6664294	0		Mud/weed		4.5m deep
11	509156	6664199	0		Mud/weed		3m deep
12	509173	6664169	0		Soft mud/weed		3m deep
13	509211	6664102	0		Soft mud/weed		5m deep
14	509490	6663726	0		Steep slope, mud	6m long timber at 10m	9m deep. Timber 6m south of coordinates
15	509517	6663661	0		Deep silt/soft mud		20m deep
16	509534	6663642	0		Deep silt/soft mud		20m deep
17	509664	6663757	1	Good	Soft mud/weed		4m deep
18	509722	6663793	1	Generally intact, rust, holes	Soft mud/weed	Tin can, 1.5m pipe	3m deep. Pipe 4.5m from coordinates

19	509731	6663765	0		V.soft mud	Cable, radiator	10.5m deep. Radiator 7.5m west of coordinates
20	509755	6663785	1	Generally intact, rust, open one end	Soft mud	Cable, radiator, tires,gas bottle, shovel,	6.5m deep,
21	509777	6663777	0		Mud	Tire, flower pot?	9m deep
22	509789	6663790	1	Rust, holes	Mud	Sticks	
23	509824	6663785	1	Generally intact, rust, holes	Mud	Tire	7.5m deep
24	509833	6663781	3	Generally intact, rust, holes	Firm mud	Tires/wood	6.5m deep
25	509882	6663795	3	Generally intact, rust, holes	Mud	4 steel cogs	2m deep
26	509932	6663796	1	Generally intact, rust, holes	Mud		2m deep
27	509983	6663808	0		Mud	steel bucket	2m deep
28	509994	6663811	1/2 barrel	Damaged, rust	Mud		1.5m deep
29	510006	6663805	0		Mud		1.5m deep
30	510225	6663888	0		Mud		3m deep
31	510596	6663921	0		Mud		2m deep
32	510977	6663900	0		Hard mud		9m deep
33	511103	6663920	0		Mud		
34	511245	6663880	0		Hard mud, sloped 3.5m-9m	Steel wheel @ 6.5m	
35	511403	6663919	0		Mud		
36	511422	6663940	0		Mud		
37	511450	6663921	0		Mud		

New coordinates, UTM zone 9v

Location	UTM Easting	UTM Northing	NUMBER OF BARRELS PRESENT	CONDITION OF BARRELS FOUND	LAKE BOTTOM SUBSTRAT?	OTHER OBJECTS	OTHER COMMENTS AND OBSERVATIONS
A	508916	6664767	1	generally intact, rust,	Mud, rock		On shore
B	509455	6663851	4	rust, holes	Mud, rock		On shore
C	511230	6663925	5	damaged, rust	Mud, rock		On shore. Barrels are partially buried
D	509431	6663906	2	crushed	Mud, rock		Crushed and torn barrels
E	509543	6663715	3	damaged, rust	Mud, rock		damaged, torn pieces of barrels, tires
F	509542	6663715	1	generally intact, rust,	Mud, rock		tires, fencing,
G	509595	6663732	0	generally intact	Mud	radiator	radiator
H	510599	6663948	1	crushed	Mud		
I	510790	6663993	1	generally intact, rust,	mud, weed		
J	511248	6663921	5	crushed	mud, stone		crushed, partially buried
K	511332	6663950	2	generally intact	Mud		Metal object approximate size of barrel, 2 small barrels near.
L	509819	6663804	16	Generally intact, crushed, pieces	Mud	pieces of metal	some small barrels, tires, pieces of metal
L	509696	6663818					
M	509833	6663781	0	damaged	Mud	large metal object	Metal object 4.5m x 1m (pod off wing?)
N	509837	6663805	5	crushed, torn	Mud		
O	509872	6663805	1	generally intact	Mud		7.5m from shore
P	510018	6663837	1	generally intact, rust,	Mud	tires	lots of tires in area
Q	509977	6663792	0	rust	Mud	barrel lid	6m from shore
R	510005	6663831	1	generally intact, rust,	Mud		6m from shore

S	510014	6663824	0		Mud	1.5m piece of square tube	
T	510522	6663908	0		Mud	hull of wooden boat	
U	511073	6663943	1	broken, rust	Mud		
V	511400	6663961	27	varied	Mud		Search area approximately 45m x 30m between coordinates.
V	511460	6663916					

Search locations –

It was apparent early on that the coordinates provided from the previously collected data from Frontier Geosciences Inc were not corresponding with what the diver was finding below the water. Often where strong targets were reported with visible barrels nothing was found. As the error in the given coordinates could not be adjusted for the survey was carried out using the coordinates as a starting point and searches broadened on the lake bed. When traveling between locations a drop camera was used to survey the lake bed, where the water depth was less than 3m crew members monitored the lake bed from the surface, where barrels and metal objects were found new locations were recorded and a further search carried out in the area.

Once all given coordinate locations and areas had been surveyed the length of airport shoreline was inspected as thoroughly as possible in the remaining time. The survey consisted of travelling the length of the water lot with a drop camera in the water and crew members looking in the shallows. All objects sighted were photographed and the coordinates recorded.

Barrels –

A total of 89 barrels were found underwater in the area surveyed. It is probable that there are more barrels outside of the surveyed areas but without further work we are unable to confirm.

A total of 10 barrels were seen along the shore at the water's edge (coordinates A, B and C), some of the barrels are buried or parts of barrels resting in sand.

Tires –

Tires were found throughout the airport water lot. Many of the tires were recorded and photographed during the survey; an accurate count of all tires could not be done without more time and a thorough survey however there are in excess of 70 vehicle tires along the airport shore line.

Metal objects -

Multiple objects in addition to barrels were found in the area surveyed, including radiators, hull of a wooden skiff, steel wheels and cogs, wire, cans, a possible pod from an aircraft wing. All objects found have been recorded individually or where they are found grouped together they are recorded as such.

Barrel condition and contents –

All the barrels are corroded to varying degrees. The majority of barrels have moderate corrosion with thin but generally intact material which appears to be strong enough to be removed from the lake without further damage. Some barrels have severe damage such as torn sides or have been crushed; these also have corrosion but appear to be strong enough to be removed without further damage or loss of material.

All the barrels inspected had holes which lead to the conclusion that the majority of the original contents has been replaced with lake water/sediment. One of the smaller barrels (suspected to hold a type of tar) appears to have a residue inside; this was determined by the diver gently rolling the barrel and finding it to be heavier on one side – visual confirmation was not possible.

Summary

The majority of the barrels, tires and other objects were found between 1m and 6m of water depth; the deepest barrel found is in 10.5m of water.

The barrels vary in condition from generally intact to crushed and in pieces. All barrels seen had holes either from mechanical impact or corrosion implying that the original contents have been replaced with lake water/silt. There remains a possibility that some of the barrels have traces of their original content and barriers should be put in place to protect the environment during removal.

89 barrels, over 70 tires (accurate count was not recorded), and multiple other objects were found along the shore line. Due to time restrictions a complete survey of the water lot could not be carried out and more objects may be in the area.

All the objects can be removed from the lake.

Photos



Coordinates #35, lake bottom



e511400, n6663961 135ft from coordinates #35



Near e511400, n6663961 obvious corrosion



Near e511400, n6663961 obvious corrosion



Near e511460, n6663916 barrel in 10.5m



Near e511400, n6663961 barrel in 3m



Coordinates #34, logs



Near coordinates #34, iron wheel



Debris near #24



barrel near #24



Large metal object near #24, possible pod off wing? Approximately 4.5m long by 1m wide





Small barrel near #22, 3.5m deep



Barrel near #23, 10m deep



Near #20, 7.5m deep



Near #20, radiator and cable, 7m deep



Radiator 25ft west of #19, 8.5m deep



Small barrel 10.5m east of #18, 6m deep



Tin can near #18, 3m deep



Barrel (tar?) possible residue, 15m west of #17



6m timbers with studs, 6m south of #14



Thick weed cover, near #12, 3m deep



Crate near shore. e509763, n6663804



Near e509819, n6663804



Bucket (?) near e509696, n6663804



Near e509696, n6663804



Broken barrels near e509696, n6663804



Tires near e509696, n6663804



Corroded barrels near e509696, n6663804



Barrel fragments near e509696, n6663804



Fence/tires/barrels e509542, n6663715



Metal object, e511332, n6663950



Near locations #15 & #16, 20m deep, very soft silt/mud, no sign of any objects between #16 and shore.



3 Coordinates marked with weighted line and floats, diver performing detailed search of shallow water.

APPENDIX C
Report on Previous Barrel Removal Activities (FTI, 1994)



**REPORT ON THE ENVIRONMENTAL
CLEANUP AND RECOVERY OF
DERELICT BARRELS FROM WATSON LAKE,
YUKON TERRITORY**

NOVEMBER 23, 1994

**FTI PROPOSAL NUMBER: P-1583
DIAND CONTRACT NUMBER: 94-0076**

Prepared for:

**DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT**
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Surrey, B.C.

Department of Indian Affairs and Northern Development
Whitehorse, Yukon Territory

Energy, Mines and Resources Canada
Ottawa, Ontario

Environment Canada - Conservation and Protection
Environmental Protection
Whitehorse, Yukon Territory

SUMMARY

As part of the Arctic Environmental Strategy (AES) of renewing and protecting the integrity of the environment, this project was carried out in order to recover derelict "forty-five gallon" drums (barrels) from Watson Lake, Yukon Territory.

The recovery of the barrels was broken down into two groups based on the recovery methods employed. One group of 130 barrels was recovered just offshore from the B.C. Forest Service's Initial Attack Base (for fighting forest fires) and the second group was made up of 84 barrels distributed around the lakeshore (Lakeshore Barrels). All the barrels were holed as a result of mechanical or corrosion damage and, for the most part, contained lake water. A number of the barrels, in particular the 130 barrels located at the Initial Attack Base, contained residues of a tar-like substance. In addition, two barrels were recovered that had motor oil and diesel fuel residues respectively.

The condition, position and distribution of the barrels located at the Initial Attack Base indicate that the majority of these barrels were deposited into the lake at the same time. The variability in the condition of those barrels located around the lakeshore indicate that they were dropped into the lake over the years. Many of the lakeshore barrels were filled with rocks or sand and were used to support docks at some point in the past.

During the recovery process, barrels were identified that were not listed in the 1991 Fraser Burrard Diving Ltd. (FBD) survey, on which the inventory of this recovery project was based. As a result of these observations, Foreshore Technologies Inc. (FTI) personnel conducted a cursory visual survey of 70% of the lake's shoreline from a boat. This survey identified 142 extra barrels not listed in the 1991 FBD survey.

Although recovery of these extra barrels was not part of the project, 11 barrels were recovered from around the lakeshore in order to make up for a short fall in the number of barrels that were expected to be retrieved from the Initial Attack Base site. The shortfall was the result of Watson Lake residents having recovered some of the barrels from the lake prior to the commencement of this project.

The presence of a significant number of extra barrels located around the lakeshore, the variances between the FBD stated longitude and latitude of debris and their actual position, and, the lack of any debris in water depths greater than 4.6 metres (15 feet) raise concerns about the thoroughness and reliability of the 1991 FBD survey. This in turn raises the questions as to how much and what type of debris still remains in Watson Lake. If a complete clean-up of Watson Lake is to be assured, then further debris surveying with appropriate technology and methods will have to be performed.

The success of this project serves as an example of how government and private industry can work together to expand local expertise and economic opportunities through the protection and recovery of arctic environments.

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**REPORT ON THE ENVIRONMENTAL
CLEANUP AND RECOVERY OF
DERELICT BARRELS FROM WATSON LAKE,
YUKON TERRITORY**

INTRODUCTION

In response to the threat of a Japanese invasion of Alaska during the Second World War, the Canadian and primarily American governments began construction of a series of military airports in order to supply Alaska with troops and materials. In 1941, Watson Lake was chosen as a site for one of these military airports. A year later, Watson Lake became a major supply depot for the construction of the Alaska Highway.

These two construction projects, along with Watson Lake's location in the southeast Yukon, near the British Columbia border, has led to its' development as an important distribution centre for tourism, mining and logging. However, the development of Watson Lake has not been without environmental impacts. One of these impacts is the accidental or deliberate dumping of debris into Watson Lake.

The presence of this debris in the lake raised concerns among local residents and government environmental agencies as to the potential environmental threat it might represent. As a result, a number of preliminary surveys of the lake were conducted.

In 1990, an investigation into the Watson Lake trout fishery identified DDT as a major contaminant. Its' presence was attributed to the common use of the pesticide to suppress mosquitoes in the area during the 1950s and 1960s. Other surveys revealed the presence of military ordnance, and although salvage operations by the Department of National Defense (DND) in the 1970s removed all the identified ordnance, there is the possibility that undetected ordnance still remains in the lake.

Under the Arctic Environmental Strategy (AES) a detailed survey of the lake bottom using side scan sonar was conducted by Fraser Burrard Diving Ltd. (FBD) in October 1991. That survey identified approximately 220 "forty-five gallon" drums (barrels), a tail section of an aircraft and two sunken boats. All the debris identified by the 1991 FBD survey was in less than 4.6 metres (15 feet) of water and was visible from the surface. No debris was found in the deeper sections of the lake.

This project, also under the AES, involved providing professional recovery services to the Department of Indian Affairs and Northern Development (DIAND) with respect to the cleanup and recovery of the barrels identified in the 1991 FBD survey of Watson Lake.

PROJECT TEAM

Foreshore Technologies Incorporated (FTI) is a British Columbia based, 100% Canadian-owned company specializing in professional and technical services in the marine and freshwater environments. These services include underwater and above-water structural inspections, environmental impact assessments, in-water environmental protection systems, underwater physical

and biological mapping, and, specialized recovery procedures. Although FTI maintains its' offices and centre of operations in North Vancouver, its' work experience includes the Maritimes, Alaska, the Territories and several international projects.

Many of FTI's projects require close contact with a number of government agencies with regard to the environment, and in particular, we have performed projects in which contact with DFO Habitat Management, Environment Canada - Ocean Dumping / Contaminants Division / Canadian Wildlife Service, B.C. Environment - Fish & Wildlife / Waste Management and Coast Guard - Navigable Waters Protection Act (NWPA) were required.

Over the past ten years, FTI has established an experienced team of professional and technical personnel who have specific salvage and environmental work experience including spill containment, deleterious substance control and military ordnance identification. FTI's approach of providing practical and technical solutions to meet its' clients' needs has earned FTI a solid reputation in the freshwater/marine engineering and environmental sciences community.

During the development of the Watson Lake barrel recovery proposal, it was decided that the project and FTI could benefit from the involvement of local residents and businesses. Specifically, local knowledge of the weather, lake conditions and alternate sources of equipment and manpower were key components in reducing the number of project contingencies. In turn, this allowed for the development of a site specific strategy for the safe and efficient recovery of the barrels.

SITE DESCRIPTION

Watson Lake is located in the southeastern portion of the Yukon Territory near the northern border of British Columbia. The community of Watson Lake is located 12 km south of the lake and 450 km southeast of Whitehorse, on the Alaska Highway, see the location map provided on Drawing No. 2.

The lake runs roughly in an east-west direction and is 8.5 km long and 2.75 km wide at its' greatest dimensions. In addition to a shallow shoreline, the lake contains a number of shoals and an island. The deepest section of the lake is reported to be 41.5 m with the lake bottom primarily made up of a fine silt.

The Watson Lake Airport and the B.C. Forest Service's Initial Attack Base (for fighting forest fires) are located along the north shore of the lake. In addition, a number of cottages and permanent residences can be found along the northeastern shore, see Photograph No. 1.

SUMMARY OF THE 1991 FBD SURVEY

The 1991 FBD survey identified a large concentration of barrels (150+) just offshore from the Initial Attack Base. An additional 73 barrels and two derelict boats were located along the northern and eastern shores of the lake, and, a derelict tail section of a plane was found on the western shore, see Drawing No. 1. The 1991 FBD survey found no barrels along the western and

southern shores or in greater than 15 feet (4.6 m) of water depth. In the survey report, barrel locations were presented as longitude and latitude fixes using a Magellan NAV 1000 Plus Satellite Navigation System or Global Positioning System (GPS). In addition, a map was provided showing the barrels relative position in the lake, see Drawing No. 1.

Apart from the 150+ barrels located at the Initial Attack Base, the barrels were found in groups of less than 12. These smaller groups, it was speculated in the FBD survey, were used to build recreational floats or docks while the barrels located at the Initial Attack Base appeared to be some form of deliberate dump. As no markings could be found on the barrels describing their contents and there was the potential of unrecovered military ordnance, the barrels were left undisturbed by the FBD divers.

PROJECT METHODOLOGY

General Approach

Of paramount importance during the project was the prevention of a contaminants release into the environment and the completion of the project before the ice cover period. It was on this basis that the following procedures for the Watson Lake cleanup were developed and carried out.

The methods described below are those that were actually performed during the recovery. They vary somewhat from those outlined in the FTI proposal as there was a significant reduction in the risk of a contaminant release once the condition of the barrels and their contents were identified. However, it is important to note that the procedures and equipment (Appendix I) described in the proposal to handle a higher risk scenario were in place and ready to be initiated throughout the course of the project.

Barrel Identification & Location

The initial task set for the FTI project team was to relocate the barrels identified in the 1991 FBD survey. Test plots of the plane tail section and the 150+ barrel site using the longitude and latitude positions provided in the 1991 FBD survey revealed significant variances between the actual and reported locations. In the case of the plane tail section the difference between the actual site and 1991 FBD GPS reported location was 1500 m, and, according to the FBD longitude and latitude fix of the 150+ barrel site it is located up on dry land at the Initial Attack Base, not in the lake, see Photograph No. 2.

In addition to these differences, the process of locating individual barrels by their longitude and latitude (GPS) would require a significant amount of time and invariably delay the project well into the ice cover period. As a result, FTI personnel resurveyed the 1991 FBD barrel positions by travelling the perimeter of the lake in a boat and estimating their position using the map supplied in the 1991 FBD survey. This method in itself was difficult as the actual shoreline contours and that shown on the FBD map often did not coincide.

Once in the area where barrels were indicated on the FBD map, FTI personnel performed a grid search in the boat until the barrel(s) were spotted from the surface. A marker buoy was then deployed so that the recovery team could return to the site to salvage the barrel(s).

This process worked well on calm days, however, on windy days the surface waves limited the depth to which the search team could view the bottom. In addition, the wave action would stir up the fine sediments on the shallow lake bottom further reducing the visibility.

During the search for the barrels identified by the 1991 FBD survey, extra barrels were observed. Although not part of the scope of this contract, FTI personnel spent one full day performing a cursory survey of approximately 70% of the lakeshore and made notes on the locations of the extra barrels. The shallow sections of the lake that were not surveyed by the FTI crew included the southern shoreline between FTI Sites 35 and 48 on Drawing No. 2, the area surrounding the island, and, the shoals located in the central portions of the lake.

Initial Attack Base Barrel Recovery Procedure

The first step in the procedure was the deployment of marker buoys indicating the approximate length and width of the Initial Attack Base barrel dump site. Next, a 33 m by 1 m spill boom was deployed in order to encompass a section of shoreline where the greatest water depth or steepest sub-surface slope was located, see Photograph No. 3. Each end of the spill boom was fixed onshore with steel pipes hammered into the ground while the outer perimeter of the boom was held in place with a series of offshore anchors.

A ground sheet of polyethylene plastic was laid down upland of the spill boom where the barrels were brought ashore and temporarily stored, see Photograph No. 4. The polyethylene sheets were placed so that any leakage from the barrels would drain down to a single point where it could be captured.

A dive survey of the barrels was conducted to determine their condition, see Photograph No. 5. Those barrels that were severely corroded and did not appear to contain any significant amounts of contaminants were recovered first. By recovering the most heavily damaged barrels first, clues as to the actual contents of the barrels could be gathered with the lowest risk of a contaminant release.

Two 22 litre buckets, attached to a lifting strap, were used to raise the barrels off the bottom in an upright position, see Photograph No. 6. While suspended in the water column the barrels were inspected for leakage and structural integrity, see Photograph No. 7. The barrels were then floated through the water column to inside the spill boom where the lift buckets were disconnected, see Photograph Nos. 8, 9 and 10.

The barrels were rolled/lifted up a ramp onto the plastic ground sheets. Any liquids leaking from the barrels while on the plastic sheets were evaluated for the physical presence of contaminants. If contaminants were present then absorbent pads were laid down and the spilled material collected. Once on land the barrels were further inspected for integrity, markings and the presence of contaminants. They were later transported to the DIAND storage site.

Lakeshore Barrel Recovery Procedure

Depending on their condition and location, the barrels located around the lakeshore were recovered using a variety of methods. Despite changes in the recovery methodology, the same barrel evaluation procedures as those used at the Initial Attack Base were employed.

Most of the lakeshore barrels were floated to the surface using lift buckets as well as filling the barrels themselves with air. Once on the surface they were lifted manually up onto the recovery barge, boat or directly up onto the adjacent shoreline. Those barrels that were filled with stones or sand were emptied prior to their recovery. Other barrels, that were sunk in the lake bottom, had to be broken free from the suction of the bottom by pulling on them with the boat, com-a-longs or jetting air into the mudline around the barrel. All of the lakeshore barrels were stored upland at key locations where road access permitted their retrieval by truck.

Transport and Storage

All barrels were transported to the specified DIAND storage site southeast of the airport using a pick-up truck and/or a trailer, see Photograph No. 11. None of the barrels leaked any significant amount of contaminants during their transport to the storage site.

A concrete pad at the DIAND site was chosen as a suitable storage area as it would form a physical barrier between the barrels and the underlying soil. In addition, a plastic sheet was laid over the concrete pad prior to storage of the barrels in order to ensure that leaked contaminants did not pass through any cracks in the concrete and into the ground, see Photograph No. 12. In order to prevent rain creating a leachate from the barrels, plastic sheets were laid over top of the stored barrels, see Photograph Nos. 13 and 14.

RESULTS

General

The project was started on September 18th with the mobilization of equipment and manpower to Watson Lake. Much of the equipment including the spill boom were shipped by truck the previous week. As per the proposal, the field work was completed on September 30th, 1994.

The actual procedures employed during the project were largely identical to those put forward in the proposal. This similarity between the actual and proposed procedures was due in part to the successful integration of local experience with FTI's technical and project management expertise.

Initial Attack Base Barrels

The condition of the barrels ranged from being corroded in half to having a few holes (2 mm in diameter). Typically, the holes were located at random over the barrel surfaces that were not buried in the lake bottom. However, in some cases the holes were concentrated on the ribs of the barrels.

The most common contaminant identified was a tar-like substance located in the bottom or adhering to the sides of some barrels. The amount of contaminant in any one barrel appeared to be less than one litre. One barrel was recovered that contained a small amount of 100 weight oil, see Photograph Nos. 15 and 16. One other barrel appeared to contain a small amount of diesel fuel. In both of these cases there was little residue left in the barrels and any spilled material was successfully collected using absorbent pads.

Barrels that had only small holes were brought upland and allowed to drain. None of the lake water that drained from these barrels contained any physical evidence of contaminants. After a period of time the barrels that had holes located around their bases would begin to ooze the residual tar-like substance, see Photograph No. 17. This oozing took place despite air temperatures of less than ten degrees Celsius.

Lakeshore Barrels

These barrels were often buckled or crushed and many of them contained sand, gravel or rocks. Although no significant amounts of contaminants were found in these barrels, evidence that these barrels contained a tar-like residue in the past was observed.

The single barrel located near the island in the centre of the lake was severely corroded and appeared to contain the same tar-like residue identified in the barrels recovered offshore of the Initial Attack Base.

FTI 1994 Cursory Survey

The results of the FTI cursory visual survey of the lakeshore identified 142 barrels (of which 11 barrels were recovered) in addition to the 73 barrels identified in the 1991 FBD survey, see Table 1. The FTI survey covered approximately 70% of the lakeshore for distances of up to 10 m offshore. The section of the lake that was not surveyed included the shallows located greater than 10 m offshore, the area surrounding the island, and, the southern shore located between FTI Sites 35 and 48 shown on Drawing No. 2.

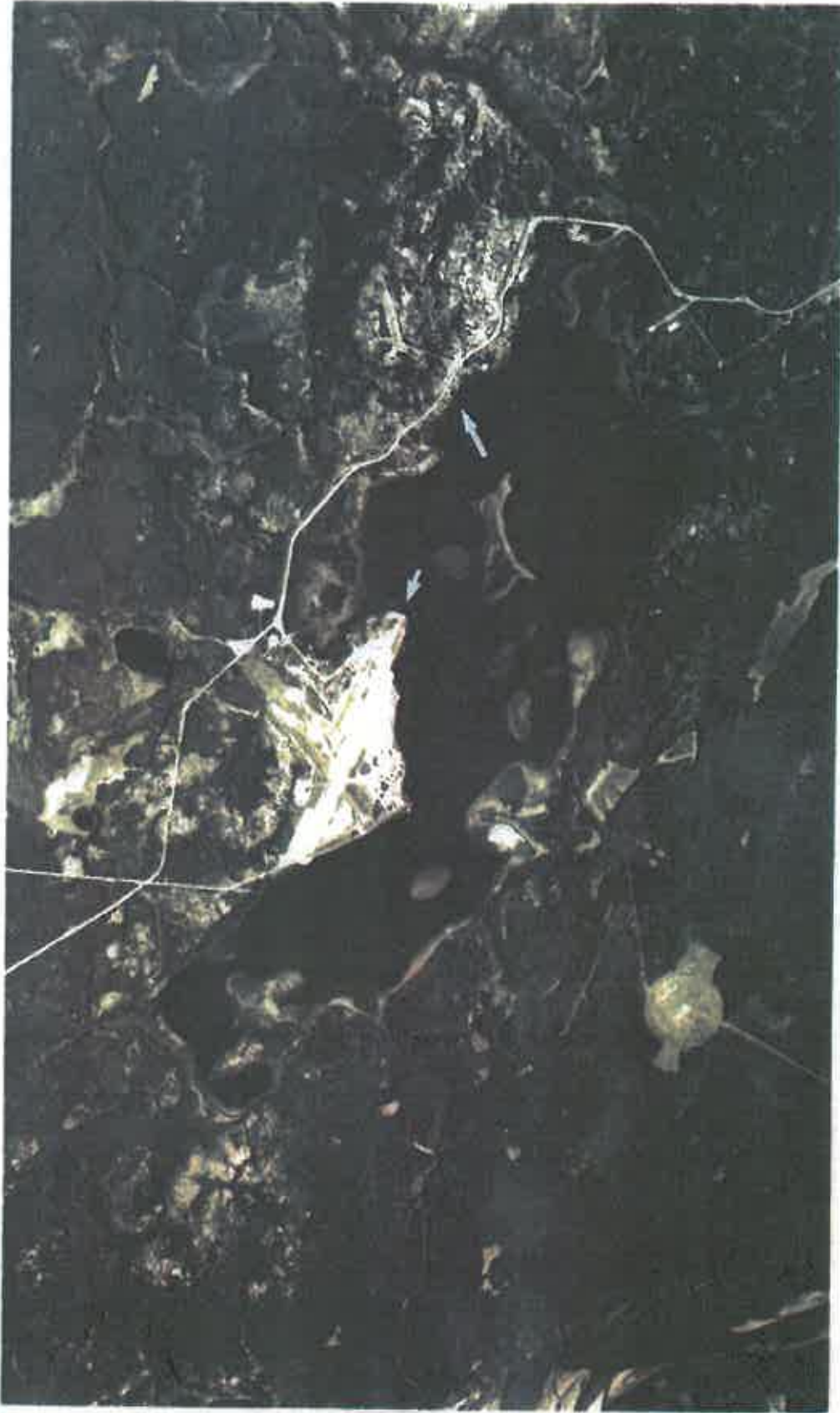
DISCUSSION AND RECOMMENDATIONS

Although this project was completed on time and on budget, the delays caused by the inaccuracies associated with the 1991 FBD survey data could have had a much greater negative impact on the project's success. If the barrels had not been visible from the surface, as a result of turbid water or because of ice cover, there would have been no way to relocate the barrels for recovery. If future recovery programs are to be successful, then accurate reproducible survey data is mandatory. In addition, the form of that data should take into account the methods that may be required to perform the recovery. In the case of Watson Lake, where all the barrels identified for recovery were located along the lakeshore, it would have been beneficial to have local geographical, physical or biological features to relocate the position of the barrels.

The similarity of the lakeshore barrels with those located at the Initial Attack Base, in terms of their condition and residual contents, suggests that many of these barrels were dumped into the lake during the same period, circa 1940s, 50s and 60s. This evidence together with the significant number (142) of extra barrels found and their distribution indicate a high probability that additional barrels or debris exists in the deeper sections of the lake. In addition, if the Initial Attack Base barrels were an example of a deliberate dump site set up during the winter so that the barrels would sink through the ice during the spring melt, then it is reasonable to expect that other dump sites would have been set up on the ice over deeper sections in the lake. In this way, the debris would not be visible from the surface, a practice that would have been preferred. As a result, further investigation into the existence of debris in Watson Lake is warranted.

Although the unrecovered extra lakeshore barrels appear to pose no environmental threat, in so far as they are likely to contain similar types and amounts of contaminants, there is no way to determine the environmental threat any one barrel may represent until it is recovered. Therefore, any future recovery projects must treat each barrel accordingly and ensure that appropriate spill response precautions and procedures are in place.

The success of this project has demonstrated that government, private industry and local residents can be combined to perform environmental recovery projects. This project has also been successful in demonstrating some environmental recovery procedures to the residents of Watson Lake. Although it would be premature to expect local residents to assume complete responsibility for recovering unknown substances from Watson Lake, with some project management assistance the bulk of any recovery work in Watson Lake could be performed locally.



PHOTOGRAPH NO.1: Aerial photograph of Watson Lake taken on September 18th, 1980 at a scale of 1:50,000. Note the location of the airport on the north shore of the lake and the small island in the southeastern section of the lake. Also note the residences along the northeastern shore (longer arrow) and the location of the B.C. Forest Service's Initial Attack Base (shorter arrow).



PHOTOGRAPH NO. 2: Aerial photograph of Watson Lake taken on June 28th, 1992 at a scale of 1:40,000. The short and long solid arrows point to the actual location of the plane tail section and the 150 + barrel site respectively. Outlined arrows point to the approximate longitude and latitude positions given in the 1991 FBD survey.



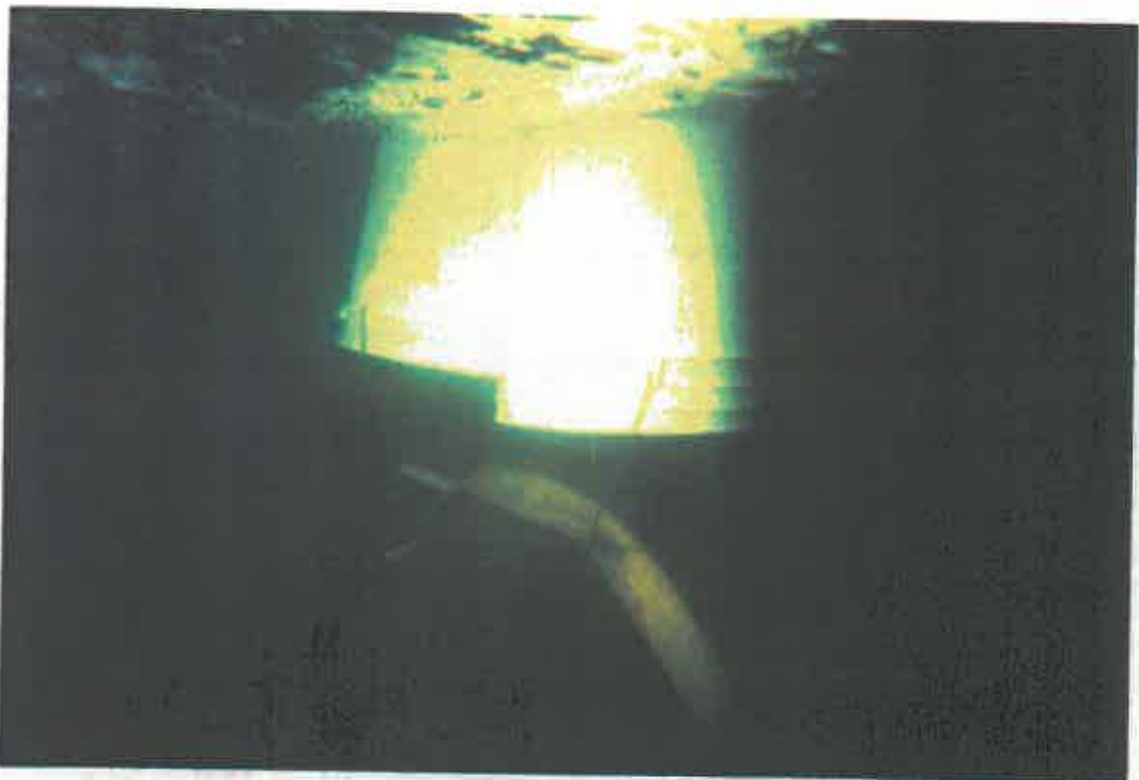
PHOTOGRAPH NO. 3: Deployed spill boom adjacent to the shoreline at the Initial Attack Base, Watson Lake. Note barrels stacked for transportation to the DIAND storage site.



PHOTOGRAPH NO. 4: Recovered barrels at the Initial Attack Base. Note plastic ground sheet and half corroded barrel (arrow).



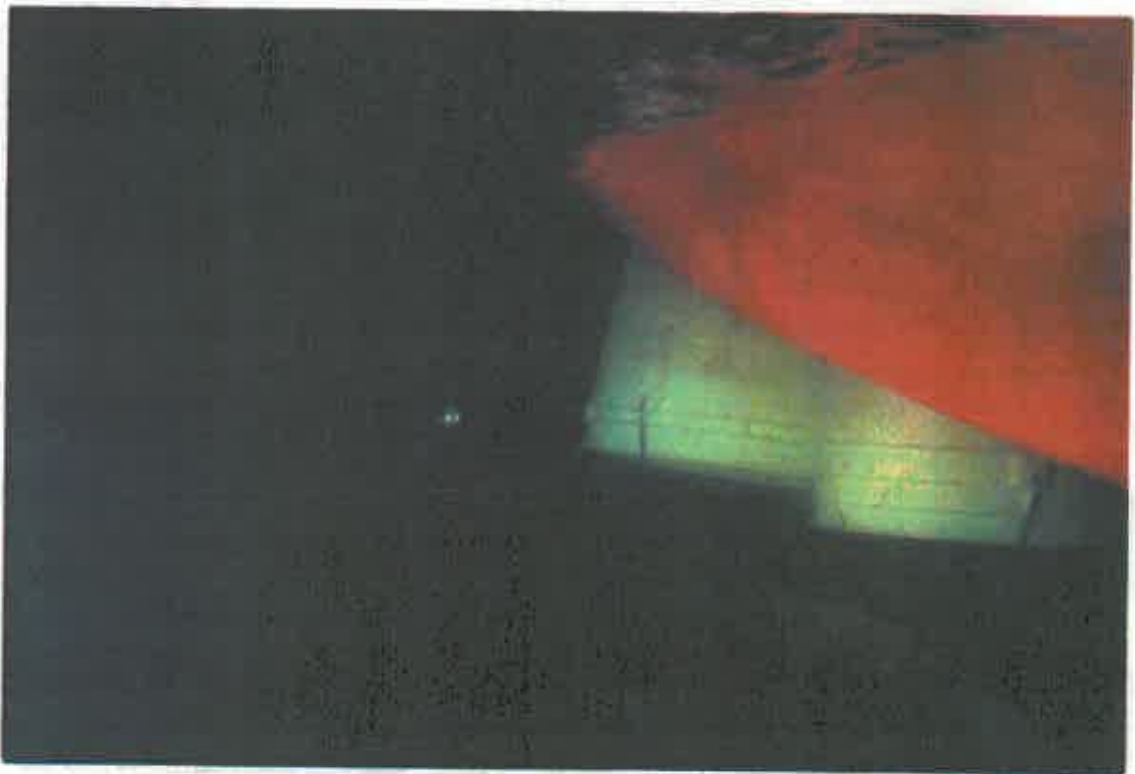
PHOTOGRAPH NO. 5: Unrecovered barrels at the Initial Attack Base site.



PHOTOGRAPH NO. 6: Two 22 litre buckets and a lifting strap being used to raise a barrel to the surface.



PHOTOGRAPH NO. 7: Barrel suspended in the water column being inspected by diver for leaks and pre-transport integrity.



PHOTOGRAPH NO. 8: Diver bringing suspended barrels under spill boom.



PHOTOGRAPH NO. 9: Diver delivering suspended barrel inside spill boom.



PHOTOGRAPH NO. 10: Diver disconnecting lift buckets inside spill boom prior to barrel removal from water. Note ramp used to roll/lift barrels out of the water up onto the plastic ground sheet.



PHOTOGRAPH NO. 11: Barrels being loaded onto pick-up truck and trailer for transportation to the DIAND storage site at the airport.



PHOTOGRAPH NO. 12: DIAND storage site. Note plastic ground sheet laid on top of concrete pad.



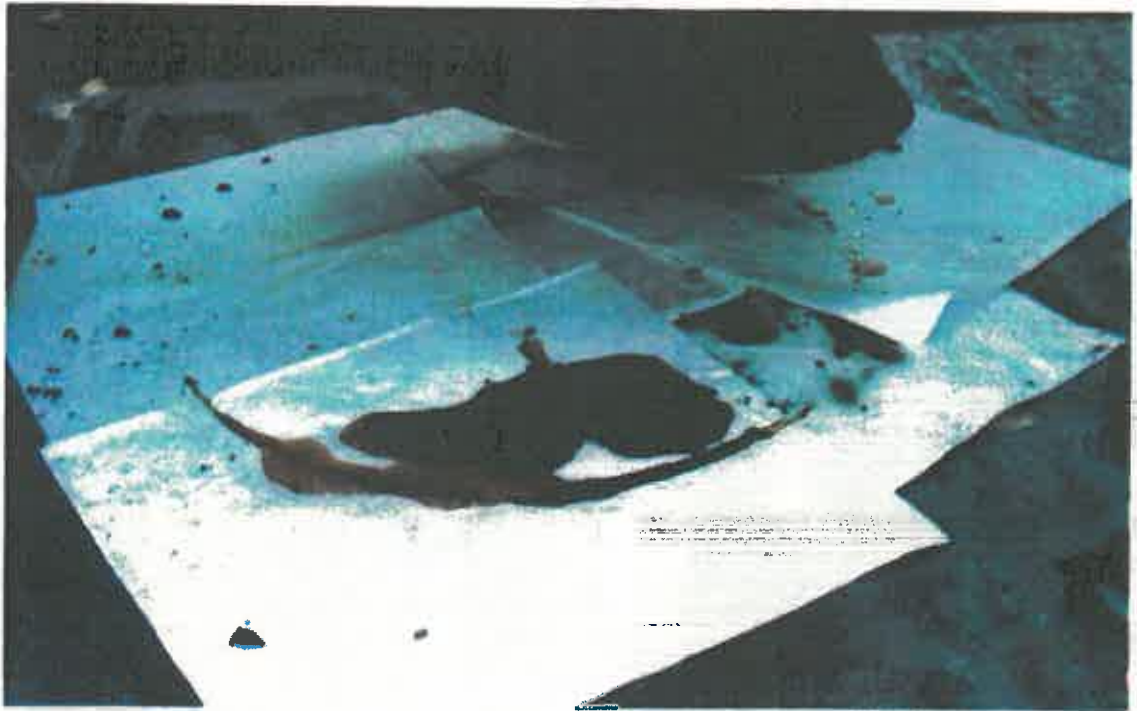
PHOTOGRAPH NO. 13: Plastic sheet being laid over top of stacked barrels. Note poor condition of some of the barrels (arrows).



PHOTOGRAPH NO. 14: Barrel storage completed and ready for transport to be recycled or destroyed.



PHOTOGRAPH NO. 15: Markings on one of the barrels recovered from the Initial Attack Base indicating that the barrel once contained 100 weight oil.



PHOTOGRAPH NO. 16: Oil residue from the barrel identified in Photograph No. 15. Spilled contaminants were recovered using oil absorbing pads and transported along with the barrels to the DIAND storage site.



PHOTOGRAPH NO. 17: Black shiny tar-like residue typical of most barrels recovered at the Initial Attack Base. Note higher levels of corrosion damage on the raised rib of the barrel.



TABLE 1

**LOCATION AND NUMBER OF EXTRA BARRELS IDENTIFIED
DURING THE FTI CURSORY VISUAL INSPECTION OF
WATSON LAKE, YUKON TERRITORY**

Site No.	No. of Barrels	Barrel Condition or Description
1	5	Underwater, sandfilled or under old dock debris
2	6	Shoreline, sandfilled
3	1	Underwater, sandfilled
4	6	FBD Site (12 barrels removed as per contract), 6 extra sand filled barrels remain
6	7	FBD Sites (5, 4 and 4 barrels removed as per contract), 7 extra shoreline sandfilled barrels remain
6	10	Underwater, scattered between FTI Site No. 5 and float
7	3	Underwater
8	2	Underwater, 1 barrel is 2/3 buried, sandfilled, beside dock in lagoon / 1 barrel is resting on bottom 20' offshore @ mouth of lagoon
9	6	Underwater between point and blue plastic float
10	1	Underwater, resting on mud, 30' offshore
11	1	Underwater, resting on mud, 30' offshore
12	2	Underwater, resting on mud, 15' & 20' offshore, 20' between barrels
13	2	Underwater, barrels resting on mud 5' & 10' offshore
14	2	Underwater, 1 barrel is 1/4 buried & 5' offshore / 1 is resting on mud
15	1	Underwater, 2/3 buried, 15' offshore
16	1	Shoreline, 1/3 buried, 15' offshore
17	1	Shoreline, resting on mud
18	2	Underwater, shallow soupy bottom, 1 barrel is 1/2 buried & broken / 1 barrel resting on mud
19	1	Shoreline, 1/3 buried
20	1	Shoreline, floating
21	1	Underwater, 2/3 buried, 40' offshore
22	1	Underwater, 3/4 buried, shoreline
23	1	Shoreline, resting on mud
24	1	Underwater, broken up, 15' offshore
25	2	Underwater, 2/3 buried, 1 barrel is on shoreline and 1 barrel is 15' offshore
26	1	Shoreline, very heavy
27	21	Underwater, spread out 50' on either side of plane fuselage
28	1	Underwater, resting on mud, 30' offshore
29	1	Underwater, resting on mud, 15' offshore
30	1	Underwater, resting on mud, 25' offshore
31	1	Underwater, 2/3 buried, 10' offshore
32	1	Shoreline, floating
33	1	Shoreline, floating
34	1	Underwater, broken up, shoreline
35	1	Underwater, flattened, 20' offshore
36	2	Underwater, 1/2 buried, 3' offshore, cabled together, heavy



TABLE 1 continued

LOCATION AND NUMBER OF EXTRA BARRELS IDENTIFIED DURING THE FTI CURSORY VISUAL INSPECTION OF WATSON LAKE, YUKON TERRITORY

Site No.	No. of Barrels	Barrel Condition or Description
37	1	Shoreline, 1/4 above water, shallow soupy bottom
38	2	1 barrel floating on shoreline / 1 barrel underwater & 3/4 buried
39	2	1 barrel sandfilled 20' offshore / 1 barrel floating on shoreline
40	1	Underwater, 20' offshore
41	1	Shoreline, 2/3 buried, sand filled
42	3	FBD Site (5 barrels removed as per contract), 3 extra barrels remain
43	6	FBD Site (10 barrels removed as per contract), 6 extra barrels remain - 2 are 30' offshore and 4 are along the shoreline & rock filled
44	1	FBD Site (1 barrel removed as per contract), 1 extra barrel remains
45	6	Shoreline, rockfilled
46	3	FBD Site (5 barrels removed as per contract), 3 plus barrels remain
47	1	Shoreline, intact & heavy
48	2	Underwater, > 30' offshore, 2 plus barrels identified
131		TOTAL NUMBER OF EXTRA BARRELS FOUND BY FTI
<p>Notes: - Eleven (11) extra barrels, not included in the above list, were recovered by FTI bringing the total number of extra barrels actually found to 142.</p> <p>- The FTI survey of Watson Lake was a cursory visual inspection and as a result it is highly probable that additional extra barrels remain in the lake.</p>		



APPENDIX I

PROJECT EQUIPMENT

Following is a list of the primary equipment used during the recovery of barrels from Watson Lake.

Spill Containment and Storage Materials

- 33 m of 1 m spill boom
- oil absorbent pads
- polyethylene bagging and catchment materials
- spill containment drums
- stretch wrap

Diving and Recovery Equipment

- SCUBA tanks
- drysuits
- regulators
- underwater Nikonos camera and strobe
- lift buckets and slinging gear
- low pressure air compressor
- 60 m of air hose

Support Equipment

- 7 m dive boat
- barge
- Hyab equipped truck
- van
- pick-up truck and trailer

APPENDIX D

Site Photographs



Photo 1: View of boat launch at Watson Lake Airport, Yukon.


SLR 	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000



Photo 2: View shallow barrel location and typical shoreline condition.


	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000



Photo 3: Barrel and other debris requiring removal at approximately 3m in depth.


	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000



Photo 4: View of the barrel at approximately 2.5m in depth requiring removal


SLR 	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000



Photo 5: Multiple corroded barrels at 3m depth requiring removal.



SLR 	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000



Photo 6: Near shore barrels requiring removal.

SLR 	Watson Lake AEC 5 Remediation Watson Lake Airport Watson Lake, YT
SITE PHOTOGRAPHS	SLR Project No: 205.03873.00000