

## **Construction Tender Documents**

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## **Drawings**

Figure 1: Site Location Plan

Figure 2: Landfarm Treatment Unit (LTU) Design

Figure 3: Details

## **Photos**

Fire Training Area Site Photos

**Supplementary Information**

a) Phase II/III Environmental Site Investigation, Firefighter Training Area, Cambridge Bay Airport, Cambridge Bay, Nunavut dated March 2011 by AECOM.

b) Phase II/III Environmental Site Investigation, Cambridge Bay Airport, Cambridge Bay, Nunavut dated March, 2010 by Franz Environmental Inc.;

**Part 1            General**

**1.1            Definition**

- The project shall be known as Cambridge Bay Airport Fire Training Area Remediation, including the construction of a Landfarm Treatment Unit (LTU) at a location adjacent to the Firefighter Training Area (FTA), located at Cambridge Bay Airport, Cambridge Bay, Nunavut.
- Departmental Representative's Authorized Personnel (DRAP): within the context of these Specifications, the term Departmental Representative's Authorized Personnel refers to personnel appointed by Departmental Representative or authorized on-site by Departmental Representative. Departmental Representative's Authorized Personnel provide recommendations/technical guidance to Departmental Representative's, as required, for the enforcement of these specifications.
- Contractor: The contractor procured to undertake the site management, remediation and restoration is defined, within the context of these specifications, as the Contractor.
- Owner: within the context of these specifications, the term Owner refers to the airport authority that operates the Site.
- Site: Area of ground on which the location of the work will be undertaken.
- The FTA is located near the north-west end of the airport runway (See Figure 1 for locations).
- The project involves site preparation, construction of a LTU, and excavation and placement of hydrocarbon impacted soils into the LTU.
- The proposed LTU location is shown on provided drawings (Figure 1). The LTU will require construction to accommodate impacted soils from the FTA area. Upon completion of tendering process and contract award, the final LTU location will be selected by the Departmental Representative during the on-site project kick off meeting.
- The LTU shall be constructed prior to the excavation and placement of hydrocarbon impacted soil from the FTA area.
- The LTU will be required to be constructed to accommodate impacted soil from the FTA area.

## **1.2 Supporting Documents**

Supporting documents include but are not limited to:

- Phase II/III Environmental Site Investigation, Cambridge Bay Airport, Cambridge Bay, Nunavut dated March, 2010 by Franz Environmental Inc.
- Phase II/III Environmental Site Investigation, Firefighter Training Area, Cambridge Bay Airport, Cambridge Bay, Nunavut dated March, 2011 by AECOM.
- Video of the Cambridge Bay Airport Fire Training Area, Cambridge Bay, Nunavut recorded August 2012 by Dillon Consulting Ltd. (DVD available upon request from Contracting Authority).

## **1.3 DESCRIPTION OF WORK**

The required work to be undertaken by the Contractor for the project will include but not be limited to the following activities:

- Preparation of a site specific Health and Safety Plan. During the completion of the site work the Contractor is responsible for site health and safety and shall designate an on-site safety coordinator.
- Mobilization of equipment and materials, installation of hoarding and project kick-off meeting.
- Geomembrane liner to be provided to Contractor on site by Departmental Representative.
- Obtaining all necessary permits to undertake the project. These may include, but not be limited to, permit to excavate and to construct the LTU.
- Provision of all necessary forces and equipment, including fencing, hoarding, signage to maintain site security and safety.
- Relocation, protection and support for all on-site utility services which would potentially be impacted by excavations at the FTA and LTU area.
- Construction and completion of the LTU for the hydrocarbon impacted soils generated from the FTA area. This would include installation of groundwater monitoring wells at the LTU as follows:
  - Installation of three (3) groundwater monitoring wells (to a maximum depth of either the bedrock or permafrost interface, which has been determined to be approximately 2.0 meter below

grade at the proposed LTU area) outside of the LTU berm boundaries and one (1) groundwater monitoring well located down gradient of the LTU (See Figure 2 for proposed groundwater monitoring well locations [W6 to W9]).

- Excavating, loading, hauling and placement of hydrocarbon impacted soils from the FTA area into the LTU.
- Dewatering of excavations may be necessary where shallow groundwater is encountered, prior to the excavation of impacted soils at the FTA area.
- Excavated areas at the FTA area shall be backfilled and the site surfaces within the excavated areas should be restored to pre-project conditions and graded in way to allow drainage.
- Installation of groundwater monitoring wells at the FTA area excavation boundaries, as follows:
  - Four (4) groundwater monitoring wells located outside of the impacted soil excavation boundaries at the FTA area (to a maximum depth of either the bedrock or permafrost interface, which has been determined to be approximately 2.0 meters below grade at this area). Exact locations of the four groundwater monitoring wells at the FTA area will be determined during the remedial excavation process by the Departmental Representative, so as to not interfere with the remedial excavation works.
- Demobilization of equipment, materials and hoarding including disposal of all waste materials generated during the site remediation.
- Operation and maintenance of the LTU is to be done by others and is not included in this contract

The above list must be completed in accordance with these Tender Documents.

#### **1.4 WORK SEQUENCE**

- .1 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.

#### **1.5 CONTRACTOR USE OF PREMISES**

- .1 Limit use of premises for Work, storage, and access to allow:
  - .1 Partial owner occupancy.
  - .2 Work by other contractors.
    - .1 The adjacent LTU and monitoring well is to build by another Contractor. The work by other may occur simultaneously.
- .2 The Contractor will have to coordinate with the Contractor on the adjacent LTU.

- .3 Co-operate with other Contractors in carrying out their respective works in the FTA area and carry out instructions from Departmental Representative's Authorized Personnel.
- .4 Co-ordinate use of premises under direction of Departmental Representative

## **1.6 OWNER OCCUPANCY**

- .1 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage. The Contractor should note activity interruptions may occur due to proximity to flight landing pathway.

## **1.7 CONTRACTOR RESPONSIBILITIES**

- .1 Contractor Responsibilities:
  - .1 Designate submittals and delivery date for each product in progress schedule.
  - .2 Review shop drawings, product data, samples, and other submittals. Submit to Departmental Representative, notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
  - .3 Receive and unload products at site.
  - .4 Inspect deliveries jointly with Departmental Representative or Departmental Representative's Authorized Personnel; record shortages, and damaged or defective items.
  - .5 Handle products at site, including uncrating and storage.
  - .6 Protect products from damage, and from exposure to elements.
  - .7 Assemble, install, connect, adjust, and finish products.
  - .8 Provide installation inspections required by public authorities.
  - .9 Repair or replace items damaged on site until final acceptance of finished product/work.

## **1.8 EXISTING SERVICES**

- .1 Notify Departmental Representative, Utility Companies and Airport Staff of intended interruption of services and obtain required permission at least 24 hours prior to interruption.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative or DRAP 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to operations.
- .3 Provide alternative routes for personnel and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative's Authorized Personnel of findings.

- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Where unknown services are encountered, immediately advise Departmental Representative's Authorized Personnel and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.

## **1.9 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Notice of Project.
  - .2 Contract Drawings.
  - .3 Specifications.
  - .4 Addenda.
  - .5 Reviewed Shop Drawings.
  - .6 List of Outstanding Shop Drawings.
  - .7 Change Orders.
  - .8 Other Modifications to Contract.
  - .9 Field Test Reports.
  - .10 Approved Work Schedule.
  - .11 Site Specific Health and Safety Plan and Other Safety Related Documents.
  - .12 Other documents as specified.

## **1.10 Measurement of Payment**

- .1 Work under this contract will be paid as follows:
  - Lump sum payment items will be paid at the lump sum price tendered for each lump sum item listed in the Basis of Pricing Schedule. Percentage of payment will be relative to percentage of completion of activity indicated on the tender form.
  - Unit price items will be paid at the unit price tendered for each unit price item listed in the Basis of Pricing Schedule.
  - Miscellaneous Project Costs (MPC) will be paid at the lump sum price tendered for "Balance of Project Costs" (BOPC) on the Basis of Pricing Form BOPC-1.
- .2 Unit price and lump sum pay items will be paid under the Basis of Pricing which will form the Basis of Payment of the proposed contract. All other items, whether specifically defined in the specific sections of the Specifications or not, will be

paid under item BOPC-1, Balance of Project Costs, in the Basis of Pricing Schedule BOPC-1.

- .3 Direct costs include all costs directly attributable to a particular pay item including equipment, operators, materials, equipment maintenance and depreciation, etc. All direct costs for lump sum and unit price are to be included in the appropriate price item in the Basis of Pricing Schedule
- .4 Indirect costs include all costs not directly attributable to the pay items including profit, supervision, overhead, administration, CGL Insurance, Worker's Safety Compensation Commission WSCC, Contractor's allowance for equipment repairs and depreciation, and any other relevant costs. All indirect costs associated with specific unit price or lump sum items will be included in Item BOPC-1, Balance of Project Costs, in the Basis of Pricing Schedule BOPC-1.
- .5 Include costs for work, goods or services required in this section that are not covered by appropriate payment clauses in other sections in Item BOPC-1, Balance of Project Costs, in the Basis of Pricing Schedule BOPC-1.
- .6 Except as indicated above, work under this section will not be measured. Include all costs in Item 00 11 21 BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule BOPC-1.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**



**Part 1            General**

**1.1               ADMINISTRATIVE**

- .1     Schedule and administer project meetings throughout the progress of the Work at the call of Departmental Representative or Departmental Representative's Authorized Personnel.
- .2     Prepare agenda for meetings.
- .3     Distribute written notice of each meeting four (4) days in advance of meeting date to Departmental Representative.
- .4     Provide physical space and make arrangements for meetings.
- .5     Preside at meetings.
- .6     Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7     Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and Departmental Representative.
- .8     Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2               PRE-MOBILIZATION SITE VISIT**

- .1     Prior to mobilization, the Contractor will perform a Pre-Mobilization site visit to check field conditions and obtain actual conditions required to ensure correct execution of the Work. Notify Departmental Representative in writing submitting a Pre-Mobilization Site Visit Report within seven (7) days of completing the site visit, of all matters which could prejudice proper execution of the Work.
- .2     Provide a minimum of seven (7) days notice to Departmental Representative prior to conducting pre-mobilization site visit.

**1.3               PROJECT START-UP/PRECONSTRUCTION MEETINGS**

- .1     Within 7 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2     Departmental Representative, DRAP, Contractor, major Subcontractors, field inspectors, Consultants and supervisors will be in attendance.
- .3     Establish time and location of meeting and notify parties concerned a minimum of five (5) days before meeting.
- .4     Agenda to include:
  - .1       Appointment of official representatives of participants in the Work.

- .2 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .3 Delivery schedule of specified equipment.
- .4 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .5 Owner-provided products.
- .6 Weekly progress claims, administrative procedures, photographs, hold backs.
- .7 Appointment of inspection and testing agencies or firms.
- .8 Insurances, transcript of policies.

#### **1.4 PROJECT MEETINGS**

- .1 During course of Work, schedule progress meetings weekly.
- .2 Contractor, major Subcontractors involved in Work, Departmental Representative, and Departmental Representative's Authorized Personnel are to be in attendance. Note: due to location of work to be conducted in a Northern Arctic Region, Departmental Representative may only be available via a teleconference.
- .3 Notify parties minimum five (5) days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three (3) days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Health and Safety and/or Environmental Protection issues.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction schedule and on completion date.
  - .12 Other business.
- .6 Worker Orientation Meeting
  - .1 Prior to start of work, conduct a worker orientation meeting for all supervisors, foreman, and Contractor's general workforce. This meeting is intended to describe the remediation activities at the site, and provide

instruction for the applicable health, safety and environmental policies and regulations related to the site Work activities.

- .1 The Contractor shall submit and receive prior approval from the The Departmental Representative's Authorized Personnel or representative the worker orientation meeting agenda.
- .2 The Departmental Representative's Authorized Personnel or representative may be in attendance.
- .2 Submit a copy of the Worker orientation agenda items covered and attendance sheet prior to commencing work or upon request of the departmental representative. Each attendee is required to sign a record of attendance upon completion of the meeting.

## **1.5 MEASURE OF PAYMENT**

- .1 All direct costs for Pre-mobilization site visit will be measured for payment by the lump sum amount under item 01 31 19-1, as indicated in the Basis of Pricing Schedule.
- .2 All direct costs for Project meetings will be measured for payment by the lump sum amount under item 01 31 19-2, as indicated in the Basis of Pricing Schedule. Project meetings include Project Start-up Teleconference Meetings, progress meetings and worker orientation. Pre-construction/ Construction meetings and any other meetings either outlined in this tender required for the completion of this contract.
- .3 All direct costs for project management will be measured for payment by the lump sum amount in item 01 31 19 -3 in the Basis of Payment Schedule.
- .4 Except as indicated above, work under this section will not be measured. Include all costs in Item 01 31 19 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 NOT USED**

- .1 Not Used.

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CAMBRIDGE BAY AIRPORT  
FIRE TRAINING AREA REMEDIATION  
CAMBRIDGE BAY AIRPORT, NUNAVUT

ISSUED FO TENDER  
Section 01 31 19  
PROJECT MEETINGS  
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**END OF SECTION**

**Part 1            General**

**1.1            ADMINISTRATIVE**

- .1      Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2      Do not proceed with Work affected by submittal until review is complete.
- .3      Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .4      Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .5      Verify field measurements and affected adjacent Work are co-ordinated.
- .6      Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .7      Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .8      Keep one (1) reviewed copy of each submission on site.

**1.2            PROJECT SCHEDULE**

- .1      Develop a detailed Project Schedule.
- .2      Ensure detailed Project Schedule includes as minimum, milestone and activity types as follows:
  - .1      Award.
  - .2      Shop Drawings, Samples, Submittals.
  - .3      Permits required by Contractor.
  - .4      Mobilization.
  - .5      Site Activities (expand as required to suit Contractor's task breakdown).
  - .6      Interim Certificate of Completion.
  - .7      Demobilization.
  - .8      Closeout Submittals.
  - .9      Final Certificate of Completion.

- .3 Submittal Procedures to Departmental Representative coordinated with Departmental Representative's Project Schedule.
- .4 After review, revise and resubmit Schedule to comply with revised Project Schedule.
- .5 During progress of Work revise, update and resubmit the Project Schedule as directed by Departmental Representative.
- .6 Provide the revised Project Schedule a minimum of three (3) days prior to scheduled monthly meetings, or as directed by Departmental Representative.

### **1.3 PROGRESS MEETING**

- .1 Submittals for Progress Meetings: make submittals at least 24 hours prior to scheduled progress meetings as follows:
  - .1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown, and material removal.
  - .2 Copies of air sampling results (contractor to keep records of air sampling results during remedial excavation activities for dust particulates, and/or volatile organic vapour exceedances above applicable regulatory standards).

### **1.4 FINAL REPORTING**

- .1 Final reports should be issued in both .doc and .pdf formats with relevant supporting documentation, site drawings and diagrams, and photographs included in the report.
- .2 Site photographs of all Site activities are required, with a sufficient number of photographs provided that adequately show the work carried out. A minimum of two photographs from two different viewpoints of each work element should be provided on a CD – organized by the tasks carried out during the project. Folders on CD should be split into 1) pre-construction photos, 2) site progress photos, and 3) final site closure photos. All photos should be in the .jpeg supported format.
- .3 Three (3) copies of reports should be provided to the Departmental Representative upon completion of site works.

### **1.5 SUBMITTAL PROCEDURES TABLE**

- .1 The Contractor must adhere to the following submittal items and proposed deadlines identified in table 01 33 00-1, unless discussed with the Departmental Representative and agreed in writing.

### **1.6 Measure of Payment**

- .1 All direct costs for project photographs are to included in the lump sum price for item 01 33 00-1, as indicated in the Basis of Payment Schedule.

- .2 All direct costs for submitted project documents not already identified in other sections of the specifications are to be included in the lump sum price for item 01 33 00-2, as indicated in the Basis of Payment Schedule.
- .3 This section will not be measured. Include all costs in Item 01 33 00 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule. Indicate the cost of this work as a separate line item in the Cost Breakdown specified in this Section.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**TABLE 01 33 00-1 CONTRACTOR SUBMITTAL SCHEDULE**

<b>Specification Section</b>	<b>Description</b>	<b>Date</b>
01 31 19	Request for Project Start up Meeting	Seven (7) contract days after award
01 31 19	Project Meeting Minutes	3 days after meeting
01 31 19	Weekly Progress Report	Weekly for duration of project
01 31 19	Preliminary Project Schedule	Seven (7) contract days after award
01 31 19	Pre-mobilization site visit report	Seven (7) days after site visit
01 31 19	Worker Orientation meeting agenda and attendance sheet	Prior to commencing Work
01 33 00	Progress Photographs	With weekly progress report
01 33 00	Final Photographs	Prior to final progress payment request
01 33 00	Equipment and Material Control Status Report	Upon request of Departmental Representative
01 33 00	Monthly Performance Measures Report	Monthly with Invoice
01 33 00	Daily Reports for Potential Additional Work	Daily, as required
01 33 00	Weekly Construction Meeting Reports	Weekly before Construction Meetings
01 35 13.43	Air Sampling results	24 hours prior to progress meeting
01 35 13.43	Pollution Control Plan	With Health and Safety Plan
01 35 29.06	Site Specific Health and Safety Plan	7 days after contract award
01 35 29.06	Inventory of Site Specific Safety Equipment	Within (10) days of Mobilization
01 35 29.06	Employee Hazardous Materials training certificates	Prior to work activities
01 35 29.06	Proof of PPE Certification	Prior to work activities
01 35 29.06	Incident /Accident Report	Verbal report immediately followed by written report in 24 hours
01 35 29.06	Work site Health and Safety Weekly inspection report	With Progress Report
01 35 29.06	Copies of Reports/Directions by Federal or Territorial Health and Safety Inspectors	Verbal report immediately followed by written report in 24 hours
01 35 29.06	On-site Contingency and Emergency Response Plan	With Health and Safety Plan
01 35 29.06	Correction Action report for non compliance Health and Safety issue	as required
01 35 29.06	Report corrective action for observed environmental non-compliance	as required
01 35 43	Copies of Environmental Approvals (Where applicable)	Prior to commencing Work or as required
01 35 43	Inventory of Environmental Protection Supplies	Within (10) days of Mobilization
01 52 00	Erosion Sediment and Drainage Control Plan	As required when revised
01 53 00	Mobilization and Demobilization Plan	Five (10) days after Contract Award
01 53 00	Mobilization Notice	Five (5) days prior to Mobilization



**TABLE 01 33 00-1 CONTRACTOR SUBMITTAL SCHEDULE**

<b>Specification</b>	<b>Description</b>	<b>Date</b>
01 71 00	Surveyor Information (name, address, certification etc)	Ten (10) days before start of construction
01 71 00	Calibration Information for Surveying Equipment	Ten (10) days prior to construction
01 71 00	Field Drawings of Services (maintained/re-routed/abandoned) and Equipment/Instrumentation	As required
01 71 00	Certified survey drawings	After completion of work or as required
01 71 00	Documentation to verify accuracy of field engineering work	Upon request of Dept Representative
01 71 00	Survey Documentation	Upon request of Dept Representative
01 77 00	Request for Final Inspection	As required
01 77 00	Record Notations on Drawings	After project completion and before final inspection
01 77 00	Project Record Documents	At Project Completion and before Demobilization
01 77 00	As built for construction of LTU	After construction
02 51 00	Groundwater monitoring well completion logs	after installation/closure report
02 51 00	Groundwater monitoring well survey elevation data/ GPS location data	after installation/closure report
02 55 13	Certification of Granular Fill and dimensions for LTU	Prior to granular placement on LTU
31 32 19.02	Geomembrane Quality Control Certificates	Prior to Liner Installation
31 32 19.02	Qualifications of Installation Supervisor and Master Seamer	Prior to Liner Installation
31 32 19.02	Geomembrane installation Test Results (non destructive testing, repairs etc)	After end of each shift production

**END OF SECTION**

**Part 1        General**

**1.1           PROTECTION OF PUBLIC TRAFFIC**

- .1    Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2    When working on travelled way:
  - .1    Place equipment in position to present minimum interference and hazards to travelling public.
  - .2    Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
  - .3    Do not leave equipment on travelled way overnight.
- .3    Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Departmental Representative.

**1.2           INFORMATIONAL AND WARNING DEVICES**

- .1    Provide and maintain signs, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2    Where transportation of excavated soils is being carried out, flaggers will be required for traffic control, in accordance with Airports Operation procedures.
- .3    Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If the situation on site changes, revise list to the approval of Departmental Representative.
- .4    Continually maintain traffic control devices in use by:
  - .1    Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
  - .2    Removing or covering signs which do not apply to conditions existing from day to day.

**1.3           OPERATIONAL REQUIREMENTS**

- .1    Maintain existing conditions for traffic crossing right-of-way.
- .2    Maintain existing conditions for traffic crossing right-of-way except when required for construction, with approval of Departmental Representative's Authorized Personnel.

**1.4 MEASURE OF PAYMENT**

- .1 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 35 00.06 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1        General**

- .1        The contractor will be responsible for obtaining and fulfilling the necessary Airport Airside Access requirements from the Cambridge Bay Airport Managers office. This may include the use of an airside escort or getting an Airside Vehicles Operations Permit (AVOP).

**1.2            GENERAL PROTECTION**

- .1        Do not disrupt airport business except as permitted by Departmental Representative.
- .2        Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic: in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .3        Provide barricades and lights where directed.

**1.3            MOVEMENT OF EQUIPMENT AND PERSONNEL**

- .1        In areas of airport not closed to aircraft traffic:
  - .1        Obtain Departmental Representative's approval on scheduling of Work.
  - .2        Control movements of equipment and personnel as directed by Departmental Representative's Authorized Personnel.
  - .3        Provide qualified field personnel at locations designated by Departmental Representative's Authorized Personnel to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
  - .4        Obey signals from airport traffic control tower instantly.

**1.4            MEASUREMENT OF PAYMENT**

- .1        Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 35 13.13 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2        Products**

**2.1            NOT USED**

- .1        Not Used.

**Part 3          Execution**

**3.1              NOT USED**

.1          Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Transportation and Dangerous Goods Act (1999)
- .2 Canadian Council of Ministers of the Environment (CCME) Documentation

**1.2 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit documentation verifying that employees have been trained, tested, and certified to safely and effectively carry out their assigned duties as applicable in accordance with Section 01 35 29.06 - Health and Safety Requirements.

**1.3 REGULATORY REQUIREMENTS**

- .1 Comply with federal, territorial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- .2 Work to meet or exceed minimum requirements established by federal, territorial, and local laws and regulations which are applicable.
  - .1 Contractor: responsible for complying with amendments as they become effective.

**1.4 SOIL STOCKPILING FACILITIES**

- .1 Temporary stockpiling of contaminated soil is not permitted.
  - .1 Excavated contaminated soil to be hauled directly into the LTU.

**1.5 VEHICULAR ACCESS AND PARKING**

- .1 Maintenance and Use:
  - .1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative's Authorized Personnel and transport and place into designated area approved by Departmental Representative's Authorized Personnel.
  - .2 Departmental Representative's Authorized Personnel may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.

**1.6 DUST AND PARTICULATE CONTROL**

- .1 Execute Work by methods to minimize raising dust from construction operations.

- .2 Implement and maintain dust and particulate control measures as determined necessary by Departmental Representative's Authorized Personnel during construction and in accordance with Nunavut regulations. Contractor will be required to provide road sweeper/cleaning facilities at the Site and access roads during the transportation of excavated soils from the excavation to the LTU area.
- .3 Departmental Representative's Authorized Personnel will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.
- .4 If Contractor's dust and particulate control is not sufficient for controlling dust and particulate emissions into the atmosphere, the Contractor shall:
  - .1 Stop work.
  - .2 Contractor must discuss procedures with the Departmental Representative's Authorized Personnel that Contractor proposes to resolve problem.
  - .3 Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

## **1.7 POLLUTION CONTROL**

- .1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
- .2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for clean-up of spills or releases readily accessible on site.
- .3 Promptly report spills and releases potentially causing damage to environment to:
  - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
  - .2 Owner of pollutant, if known.
  - .3 Person having control over pollutant, if known.
  - .4 Departmental Representative and Departmental Representative's Personnel.
- .4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in clean-up or mitigating action.
- .5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- .6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all

times in which hazardous materials or wastes as defined by the Government of Nunavut Department of Environment are being handled or transported. Spill response materials shall be compatible with type of material being handled.

## **1.8 EQUIPMENT DECONTAMINATION**

- .1 Commence Work involving equipment contact with potentially contaminated material only after Equipment Decontamination Facility is operational.
- .2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas. Contractor must keep decontamination equipment close to dig areas.
- .3 At minimum, perform following steps during equipment decontamination:
  - .1 mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated.
  - .2 Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and approved by Departmental Representative. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages.
  - .3 Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean zone before removing from site or travelling on clean areas. Perform assessment as directed by Departmental Representative's Authorized Personnel to determine effectiveness of decontamination.

## **1.9 WATER CONTROL**

- .1 Maintain excavations free of water.
- .2 Protect site from puddling, ponding or running water. Grade site to drain.
- .3 Prevent surface water runoff from entering or leaving Work areas.
- .4 Do not discharge decontamination water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off the site.
- .5 Prevent precipitation onto Site from infiltrating or from directly running off stockpiled waste materials. Cover stockpiled waste materials with an impermeable liner during periods of Work stoppage, including at end of each working day and periods of heavy precipitation, and, as directed by the Departmental Representative's Authorized Personnel.
- .6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems (away from the work area).
- .7 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction in accordance with applicable regulation.



- .8 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other Work areas free from water.

#### **1.10 DEWATERING**

- .1 Dewater various parts of Work including, without limitation, excavations, structures, and work areas.
- .2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
- .3 Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
- .4 Provide sufficient and appropriate labour, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.
- .5 Take precautions necessary to prevent uplift of structure or pipeline and to protect excavations from flooding and damage due to surface runoff.
- .6 Test and analyze water generated from dewatering activities and treat to meet required applicable discharge or disposal criteria.
- .7 Water generated from dewatering is to be stored in barrel(s).

#### **1.11 PROGRESS CLEANING**

- .1 Maintain cleanliness of Work and surrounding site to comply with federal, territorial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

#### **1.12 FINAL DECONTAMINATION**

- .1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from Site.
- .2 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

#### **1.13 REMOVAL AND DISPOSAL**

- .1 Remove surplus materials and temporary facilities from Site.
- .2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off-site.

- .3 Do not burn or bury rubbish and waste materials on-site.
- .4 Do not discharge wastes into streams or waterways.
- .5 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by Departmental Representative's Authorized Personnel:
  - .1 Debris including excess construction material.
  - .2 Non-contaminated litter and rubbish.
  - .3 Disposable PPE worn during final cleaning.

**1.14 TESTING**

- .1 Carry out and pay for all testing required to confirm that wastewater including dewatered groundwater from the FTA comply with applicable discharge criteria for the Site.

**1.15 RECORD KEEPING**

- .1 Maintain adequate records to support information provided to Departmental Representative.

**1.16 MEASUREMENT OF PAYMENT**

- .1 The Dewatering activity will be measured for payment by the lump sum price for Dewatering under item 01 35 13.43, as indicated in the Basis of Pricing Schedule.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 35 13.43 of the BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule BOPC-1.

**Part 2 Product**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Occupational Health and Safety Act, R.S.N. [1990].
- .3 Northwest Territories and Nunavut
  - .1 Occupational Health and Safety Act, R.S.Y. [1986].

**1.2 SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Site-specific Health and Safety Plan: Submit within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Results of site-specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
  - .3 Precautions that will be taken to minimize hazards.
  - .4 Medical emergency procedures that will be followed in case of accident requiring medical attention, including a contact list of hospitals, fire department.
  - .5 A Fire Safety Plan.
- .3 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .4 Submit copies of reports or directions issued by Federal and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five (5) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within two (2) days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

- .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

### **1.3 SAFETY ASSESSMENT**

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

### **1.4 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

### **1.5 GENERAL REQUIREMENTS**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project site conditions as represented in supplementary information.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .3 All personnel entering the site area shall be equipped with steel-toed work boots, hard hats, hearing protection, high visibility, and safety glasses as required by the Occupational Health and Safety ACR and used on site at all times.
- .4 Workers shall be equipped with appropriate personal protective equipment. All workers on site must use or wear such equipment as to limit exposure to hazardous materials if they are encountered.
- .5 Workers may be required to wear respirators if vapour levels exceed regulations. All workers on site are required to be instructed in the proper use and maintenance of respirators and are required to be fit-tested.
- .6 High visibility safety vests shall be worn by all site workers.
- .7 Avoid skin contact and inhalation of hydrocarbon products.
- .8 All hydrocarbon contaminated soaked clothing should be properly disposed of.
- .9 Shore and brace excavated slopes and banks according to applicable regulations.

### **1.6 FIRE AND EXPLOSION PREVENTION**

- .1 All workers must take precautions to eliminate all potential sources of ignition from the site area including non-explosion-proof electrical and internal combustion equipment.
- .2 Fires and burning of waste or materials are not permitted on-site.

- .3 Prevent accumulation of vapours at ground level.
- .4 Report fires immediately by fastest means possible, report all fires incidents to the Departmental Representative and local fire facilities.
- .5 Maintain fire extinguishers in sufficient quantity to protect all site workers.
- .6 Smoking is not permitted on work site.

#### **1.7 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

#### **1.8 COMPLIANCE REQUIREMENTS**

- .1 Comply with Safety Act, General Safety Regulations, R.R.N.W.T. (Nu) 1990 c S-1.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

#### **1.9 UNFORSEEN HAZARDS**

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

#### **1.10 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with hydrocarbon contaminated soil.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work.

**1.11 POSTING OF DOCUMENTS**

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

**1.12 CORRECTION OF NON-COMPLIANCE**

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

**1.13 WORK STOPPAGE**

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 The contractor is assigned the responsibility and obligation to stop and start Work when, at the health and safety coordinator's discretion, it is necessary or advisable for reasons of health and safety. The Departmental Representative (or DRAP) may also stop Work for health and safety considerations.

**1.14 MEASUREMENT OF PAYMENT**

- .1 All direct costs for the site specific health and safety plan are to included in the lump sum price for item 01 35 29.06, as indicated in the Basis of Payment Schedule.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 35 29.06 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2            Products**

**2.1                NOT USED**

.1            Not used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not used.

**END OF SECTION**

**Part 1 General**

**.1 Definitions:**

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment 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; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.3 FIRES**

- .1 Fires and burning of rubbish on-site not permitted.

**1.4 SITE CLEARING AND PLANT PROTECTION**

- .1 Protect vegetation on site and adjacent properties as indicated.
- .2 Minimize stripping of topsoil and vegetation.

**1.5 WORK ADJACENT TO WATERWAYS**

- .1 Construction equipment to be operated on land only.
- .2 Do not use waterway beds for borrow material.
- .3 Waterways to be free of excavated fill, waste material and debris.

**1.6 POLLUTION CONTROL**

- .1 Control emissions from equipment and plant to local authorities' emission requirements.
- .2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

**1.7 NOTIFICATION**

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Territorial or Municipal environmental laws or regulations, permits.



- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
  - .1 Do not take action until after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

## **1.8 HAZARDOUS MATERIAL DISCOVERY**

- .1 Stop Work immediately and notify Departmental Representative upon discovery of following materials during course of Work:
  - .1 Unknown and/or potentially hazardous substances.
- .2 Work at site may involve contact with:
  - .1 PHC (total petroleum hydrocarbons) impacted soils.
  - .2 Hazardous liquids and petroleum based liquids.

## **1.9 OTHER ITEMS OF DISCOVERY**

- .1 Stop Work immediately and notify Departmental Representative upon discovery of following items during course of Work:
  - .1 Items that may have archaeological, cultural or scientific significance.

## **1.10 MEASUREMENT OF PAYMENT**

- .1 Include all direct costs for the supply and transport of the specified Environmental Protection Supplies in the lump sum price for Environmental Procedures, Item 01 35 43, as indicated in the Basis of Pricing Schedule.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1               SUBMITTALS**

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

**1.2               INSTALLATION AND REMOVAL**

- .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.
- .2       Identify areas which have to be gravelled to prevent tracking of mud.
- .3       Indicate use of supplemental or other staging area.
- .4       Provide construction facilities in order to execute work expeditiously.
- .5       Remove from site all such work after use.

**1.3               CONSTRUCTION PARKING**

- .1       Parking will be permitted on site provided it does not disrupt performance of Work.
- .2       Provide and maintain adequate access to project site.
- .3       Clean runways and taxi areas where used by Contractor's equipment.

**1.4               SECURITY**

- .1       Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

**1.5               SANITARY FACILITIES**

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

**1.6               PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1       Maintain and protect traffic on affected roads during construction period as per Airport Protocols for safety and access, except as otherwise specifically directed by Departmental Representative's Authorized Personnel.
- .2       Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around

and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads.  
Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .7 Dust control: adequate to ensure safe operation at all times.
- .8 Provide snow removal during period of Work.

#### **1.7 CLEAN-UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.

#### **1.8 TEMPORARY FACILITIES**

- .1 Provide temporary construction facilities in order to execute Work expeditiously. This includes temporary office space, sanitary facilities, communication services, utilities and other required facilities.
- .2 Remove from site all such Work after use.

#### **1.9 TEMPORARY ACCOMODATIONS AND MEALS**

- .1 The Contractor will provide temporary accommodations and meals for contractor personnel not local to the site area.

**1.10 MEASURE OF PAYMENT**

- .1 Include all direct costs for the supply and transport of the supply and operation of temporary facilities in the lump sum price, Item 01 52 00 -1, as indicated in the Basis of Pricing Schedule.
- .2 Include all direct costs for the temporary accommodations and meals in the lump sum price, Item 01 52 00-2, as indicated in the Basis of Pricing Schedule. This amount is not to exceed Treasury Board guidelines for work in Nunavut.
- .3 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 52 00 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

**END OF SECTION**

**Part 1 General**

**1.1 GENERAL**

- .1 Provide all labour, equipment and materials, and performance of all Work necessary for mobilization to, and demobilization from site. This will include all Departmental Representative provided supplies, equipment and material.
- .2 Mobilization to include transportation to site of Contractor's labour, equipment, materials, and assembling, erecting, and preparing site in readiness to start Work, all in accordance with Contractor's Schedule.
- .3 Demobilization to include dismantling and removal from site, of all Contractor's equipment, camp facilities and materials, waste resulting from cleanup of site and transportation of labour from site.
- .4 Decontaminate and clean all equipment used on the Project prior to demobilization.
- .5 Do not mobilize to the site without written authorization from the Departmental Representative.
- .6 Summarize the proposed mode, route, equipment, labour and all other requirements for the mobilization and demobilization of all required equipment, materials, waste and personnel to complete the remediation of the project, as indicated in these specifications, in a Mobilization and Demobilization Plan. Submit the Mobilization and Demobilization Plan to the Departmental Representative a maximum of 10 days after contract award.
- .7 All mobilization and demobilization methods to comply with the requirements of all applicable codes, standards, guidelines and permits, approvals and/or authorizations.
- .8 A Post-Demobilization site visit will be required as part of the Post-Demobilization Inspection. Once demobilization is completed, Departmental representative will request a Post-Demobilization inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

**1.2 SUBMITTALS**

- .1 Submit Mobilization and Demobilization Plan in accordance with Section 01 33 00 – Submittal Procedure for review by Departmental Representative.
- .2 Submit to Departmental Representative, three (3) hard copies and one (1) electronic copy of the Mobilization and Demobilization Plan, 10 days after contract award.

**1.3 MEASURE OF PAYMENT**

- .1 All costs for Mobilization to site of all equipment and materials, including the submission of the Mobilization and Demobilization Plan, are to be included in the lump sum price for Mobilization Item 01 53 00-1 and Demobilization Item 01 53 00-2 , as indicated in the Basis of Pricing Schedule. The lump sum price for mobilization is to include all labour, equipment, materials, meals, accommodation, flights and any other costs necessary to undertake work required.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 53 00 BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**1.4 NOT USED**

- .1 Not Used.

**Part 2 Execution**

- .1 Not Used.

**END OF SECTION**

**Part 1        General**

**1.1            INSTALLATION AND REMOVAL**

- .1      Provide temporary controls in order to execute Work expeditiously.
- .2      Remove from site all such temporary controls after use.

**1.2            HOARDING**

- .1      Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .2      Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.3            GUARD RAILS AND BARRICADES**

- .1      Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

**1.4            ACCESS TO SITE**

- .1      Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

**1.5            PUBLIC TRAFFIC FLOW**

- .1      Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

**1.6            FIRE ROUTES**

- .1      Maintain access to property including overhead clearances for use by emergency response vehicles.

**1.7            PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1      Protect surrounding private and public property from damage during performance of Work.
- .2      Be responsible for damage incurred.

**1.8            PROTECTION OF BUILDING FINISHES**

- .1      Provide protection for finished and partially finished building finishes and equipment during performance of Work, where applicable.
- .2      Provide necessary screens, covers, and hoardings.

- .3 Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

**1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling.

**1.10 MEASUREMENT OF PAYMENT**

- .1 The supply and installation of Hoarding or temporary fencing and safety signage measure of payment will be measured for payment by the lump sum amount. All costs should be included in Item 01 56 00 of the Basis of Pricing Schedule.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 56 00 BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**



**Part 1            General**

**1.1                QUALIFICATIONS OF SURVEYOR**

- .1      Qualified registered land surveyor, licensed to practice in Nunavut, acceptable to Departmental Representative.

**1.2                SURVEY REFERENCE POINTS**

- .1      Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .2      Make no changes or relocations without prior written notice to Departmental Representative.
- .3      Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .4      Require surveyor to replace control points in accordance with original survey control.

**1.3                SURVEY REQUIREMENTS**

- .1      Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2      Establish lines and levels, locate and lay out, by instrumentation.
- .3      Stake for grading and fill.
- .4      Stake slopes and berms.
- .5      Record Global Position System (GPS) coordinates in NAD 83 coordinate system of excavation extent. This information will be used for future development planning purposes.

**1.4                EXISTING SERVICES**

- .1      Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2      Remove abandoned service lines within two (2) m of proposed FTA excavation and LTU. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

**1.5                RECORDS**

- .1      Maintain a complete, accurate log of control and survey work as it progresses.

- .2 On completion of LTU foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

## **1.6 SUBMITTALS**

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit other project documentation relevant to this section and in accordance with Section 01 33 00.

## **1.7 SUBSURFACE CONDITIONS**

- .1 Promptly notify Departmental Representative in writing if subsurface conditions at site differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Departmental Representative determine that conditions do differ materially; instructions will be issued for changes in Work as provided in Changes and Change Orders.

## **1.8 MEASURE OF PAYMENT**

- .1 Surveying measure of payment will be based upon a lump sum amount. Include costs for the work described in Item 01 71 00 of the Bid Price Schedule.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 71 00 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1        General**

**1.1        ADMINISTRATIVE REQUIREMENTS**

- .1    Acceptance of Work Procedures:
  - .1    Contractor's Inspection: Contractor shall conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    - .1    Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
  - .2    Departmental Representative Inspection:
    - .1    Departmental Representative, Departmental Representative's Authorized Personnel, and Contractor to inspect Work and identify defects and deficiencies.
    - .2    Contractor to correct Work as directed.
  - .3    Completion Tasks: submit written certificates in English that tasks have been performed as follows:
    - .1    Work: completed and inspected for compliance with Contract Documents.
    - .2    Defects: corrected and deficiencies completed.
    - .3    Work is completed and ready for Final Inspection.
  - .4    Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by the Departmental Representative, complete outstanding items and request reinspection.
  - .5    Post-Demobilization Inspection: once demobilization is completed, Departmental representative will request a Post-Demobilization inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by the Departmental Representative, complete outstanding items and request reinspection.
  - .6    Contractor will provide final as-built drawings for construction of LTU to the Departmental Representative for final review.
  - .7    Declaration of Final Completion: as per general condition.
  - .8    Submit Close out report

**1.2        FINAL CLEANING**

- .1    Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2    Waste Management: separate waste materials for reuse and recycling.

**1.3 MEASURE OF PAYMENT**

- .1 All direct costs for the Post-Demobilization Site Visit in the lump sum price for Post-Demobilization Site Visit, Item 01 77 00, as indicated in the Basis of Pricing Schedule.
- .2 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 01 77 00 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1 General**

**1.1 Summary**

.1 Section includes:

The requirements for the supply and installation of groundwater monitoring wells. All instrumentation is to be installed under the supervision of Departmental Representative's Authorized Personnel who will prepare the installation reports.

**1.2 Definitions**

.1 Instrumentation is defined as materials and equipment required to complete the installation of groundwater monitoring wells at the LTU and FTA area.

**1.3 Measure of Payment**

.1 The installation of monitoring wells includes all monitoring well supplies and the required equipment utilized for the advancement of test pits will be measured for payment by a lump sum. This will include time spent advancing each test pit and the time spent installing each monitoring well along with the necessary supplies required to complete each groundwater monitoring well location. Include all costs for the equipment required to install groundwater monitoring wells at the LTU in Item 02 51 00-1, and at the FTA area in Item 02 51 00-2 of the Basis of Pricing Schedule.

.2 The supply and installation of pre-packed monitoring wells, including protective covers, bentonite seal, grout, and all accessories will be measured for payment by the number of monitoring wells supplied and installed as specified herein. Include all costs for the supply of materials for groundwater monitoring wells at the LTU in Item 02 51 00-1, and at the FTA area in Item 02 51 00-2 of the Basis of Pricing Schedule.

.3 The supply of a qualified utility locator for the work described in this section will be measured and included for payment by the lump sum amount in item 02 55 13 -1 of the Basis of Pricing Schedule as outlined in section 02 55 13.

.4 Except as indicated above, work under this section will not be measured. Include all costs in Item 02 51 00 of the BOPC-1 in Basis of Pricing Schedule.

**Part 2 Products**

**2.1 Monitoring Well Materials**

.1 The groundwater monitoring wells will be constructed of 2" PVC plain and slotted screen sections with a 4" outer casing that include a pre-pack installation of frac sand filter of environmental quality, with slip-on end caps on each well.

**2.2 Monitoring Well Protective Casing**

- .1 150 mm metal casing to be placed over the monitoring well end cap. Casing shall extend a minimum of 750 mm above ground surface.

**2.3 BENTONITE SEAL**

- .1 The monitoring well's annulus leading to the ground surface will be backfilled with bentonite slurry or clean backfill material. The bentonite product shall be certified as polymer and organic free.

**2.4 GROUT**

- .1 Preblended, cementitious, ready to use, pile and rock bolt grout, suitable for placement into substrates with temperatures above -10°C.

**Part 3 Execution**

**3.1 Installation of Monitoring Wells**

- .1 After all contaminated soil placement activities have been completed at the LTU install groundwater monitoring wells. For the LTU install three (3) groundwater monitoring wells outside the berm boundaries and one (1) groundwater monitoring well located down gradient of the LTU. Refer to Figure 2 for the proposed monitoring well locations.
- .1 Advise Departmental Representative a minimum of 10 days in advance of groundwater monitoring well installation program to allow scheduling of inspection services by Departmental Representative's Authorized Personnel. Departmental Representative or designated representative will be in attendance for the duration of the installation program.
- .2 After all excavation activities have been completed at the FTA area, the Contractor will install four (4) groundwater monitoring wells outside the FTA area contaminated soil excavation limits, with locations of groundwater monitoring wells to be determined by the Departmental Representative.
- .3 The installation depth and screen intervals for the groundwater monitoring wells located at the FTA area will be determined after all contaminated soil has been excavated, in discussion with the Departmental Representative.
- .4 Monitoring well completion details must be measured and reported to the Departmental Representative's Authorized Personnel.
- .5 All monitoring wells require the top of well casing to be marked and surveyed by the Site Surveyor, as well as the ground level next to the monitoring well.
- .6 The installation depth for groundwater monitoring wells located at the LTU will be to a maximum of 2.0 meters below ground surface (m bgs) or when either bedrock or the permafrost active zone is encountered, which ever come first.

### **3.2 Protection of Monitoring Wells**

- .1 Monitoring wells require a 150 mm diameter above ground metal casing to be placed over the monitoring well, and cemented/grouted in place firmly as to protect the monitoring well and stop vertical or horizontal movement.

**END OF SECTION**

**Part 1        General**

**1.1        Definitions**

- .1        Hydrocarbon impacted soil is defined as soils containing concentrations exceeding the Canadian Council Minister of the Environment (CCME) Commercial Land (CL) guidelines of any or all of the contaminants listed as follows:
  - Benzene, ethylbenzene, and hydrocarbon fraction F2 in soils
- .2        Contaminated Soil is defined as hydrocarbon impacted soil areas at the FTA area. (see Figure 1 for locations)
- .3        Backfill is defined as being the material required to develop the excavations back to pre-construction grade.

**1.2        Quality Assurance**

- .1        Qualifications
  - .1        Be thoroughly familiar with and knowledgeable about existing site conditions, scope of work and requirements of the Specification.
  - .2        Contractor's personnel trained as described in this Section are to instruct and direct all workers with respect to the waste management procedures and labour and safety practices to be followed in carrying out the work.
  - .3        Provide workers, Department Representative and Department Representative's staff when required with protection appropriate to the potential type and level of exposure. Establish specific safety protocols in the Site Specific Health and Safety Plan.

**1.3        Site Conditions**

- .1        Suspend all work on site whenever weather conditions become unacceptable for the construction of the LTU, soil excavation or backfilling, or otherwise performing the Work to conform with this specification.
- .2        During and after heavy rainfall, make sure that equipment is not operated in the Work areas so as to cause unwanted affect to this specification, and wait until the material has dried sufficiently to prevent rutting.
- .3        Prior to the commencement of the Work, make sure to remove all debris, snow, ice, standing water from the LTU area and excavation areas.
- .4        Prior and during excavation of contaminated soil, make sure the excavation is stable and maintained in this manner, and allow for the dewatering of shallow groundwater areas or surficial water ingress to the excavation, as directed by the Departmental Representative's Authorized Personnel.



- .5 Ensure all utilities are located by a qualified locator prior to commencing the Work and if required, utilities are relocated or capped in a safe manner, after discussion with the Departmental Representative.

#### **1.4 Protection**

- .1 All Work performed must be in accordance with the environmental protection measures specified in Section 01 35 43.
- .2 Any discharging of water resulting from the dewatering of excavation areas must be in accordance with Section 01 35 43 Environmental Procedures and Section 01 35 13.43 Special Project Procedures for Contaminated Sites.

#### **1.5 Measure of Payment**

- .1 The supply of a qualified utility locator for work required in this section will be measured and included for payment by the lump sum Item 02 55 13-1 in the Basis of Pricing Schedule.
- .2 The construction of the LTU will be measured for payment by the square metre. The cost includes the construction, excavation, berm and grading in item 02 55 13-2 of the Basis of Pricing Schedule
- .3 The granular fill (for LTU demarcation cell),  $\frac{3}{4}$ " (20mm) crush or a Departmental Representative's Authorized Personnel approved alternate, will be measured for payment by cubic meters. The survey volume the LTU granular fill will be provided to the Departmental Representative's Authorized Personnel for confirmation of cover. The cost will include haulage from the quarry and placement/installation on top of the LTU liner in item 02 55 13-3 of the Basis of Pricing Schedule.
- .4 The excavation of contaminated soil from the FTA Area will be measured for payment by the cubic metre of contaminated soil as determined from surveyed measurements of the excavation. Cost for this specification includes excavation, loading, hauling and placing impacted soil from the FTA area to the LTU in Item 02 55 13 -4 in the Basis of Pricing Schedule.
- .5 The backfilling of the FTA Area excavation is measured for payment by the cubic metre placed and compacted in place. The cost includes supply of fill, placement and compaction to original ground in Item 02 55 13 -5 of the Basis of Pricing Schedule. The volume of backfill material used will be determined by survey method. The Contractor shall be responsible for all the quantity survey and shall provide this information to the Departmental Representative or the Departmental Representative's Authorized Personnel.
  - .1 The initial site surface contours prior to excavations will be surveyed.
  - .2 Survey significant breaks in the original ground surface grade.
  - .3 The bottom/floor of the FTA excavations shall be surveyed after contaminated soil has been excavated.
  - .4 The excavated area shall be surveyed within a maximum of two (2) days from initial excavation for quantity measurement.

- .5 The survey volume of all excavated soil will be provided to the Departmental Representative prior to any backfilling activities.
- .6 The maximum distance between cross sections or grid points is to not exceed 20 metres unless otherwise indicated by Departmental Representative. Survey measurements are to be to the nearest 0.01 metre.

**Note:** Typical soil conditions encountered during the Work will be silty sands with an average soil density of 1.6 throughout, as described in the Tender Package supporting information.

- .6 No extra payment will be made for soil removed from beyond the specified limits of excavation, unless such removal has been specifically directed by the Departmental Representative or Departmental Representative's Authorized Personnel. The volume of contaminated soil excavation beyond the specified limits that have been approved by Departmental Representative will be determined by survey method.
- .7 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 02 55 13 BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Fill:
  - .1 Characterized and compactible to meet decontamination objectives and should be within applicable Regulatory Guidelines for the Site.
- .2 LTU Materials
  - .1 300 mm (12 inch) diameter PVC pipe. The PVC pipe shall be at least 1.0 m in length with a 0.5 m long slotted screen section.
  - .2 A single-sided textured HDPE Geomembrane as per Section 31 32 19.02 – Division 3 Geomembranes (Provided by Owner).
  - .3 Granular Fill, 3/4" (20mm) crushed or an alternate approved by the Department Representative or Department Representative's Authorized Personnel.
  - .4 Rock cobbles (100 to 300 mm diameter) to secure exposed LTU liner.

### **2.2 ENVIRONMENTAL PROTECTION SUPPLIES**

- .1 Environmental Protection Supplies: as per Section 01 35 43 – Environmental Procedures.

**Part 3 Execution**

**3.1 CONTAMINATED SOIL EXCAVATION**

- .1 A description of the soil conditions at the borehole locations for the FTA Area are shown on the borehole records in the Franz & AECOM reports included in "Supplementary Information". The information provided in the Supplementary Information are for general information purposes only and may not represent all the soil conditions that will be encountered during excavation.
- .2 The area for soil excavation of the FTA Area will be generally located on the north-west end of the airport runway. (See Figure 1).
- .3 Previous studies as provided in the "Supplementary Information" have identified at the FTA Area benzene, ethylbenzene, and hydrocarbon fraction F2 in soils exceeding the Canadian Council Minister of the Environment (CCME) Commercial Land (CL) guidelines. The Contractor shall review all of the Supplementary Information. The Contractor's price for soil excavation and placement must include all contaminated soils identified in the Franz and AECOM reports, including fill soil and any other debris that may be encountered.
- .4 The Contractor is responsible to ensure that all contaminated soil within the FTA Area above CCME Commercial Land guidelines is excavated and placed in the LTU. When the excavation approaches the suspected boundary where concentrations of regulated parameters are less than CCME Commercial Land guidelines, verification samples will be collected by the Departmental Representative's Authorized Personnel for analytical testing. It is proposed to perform the verification sampling in sequential stages around the perimeter and base of the excavation such that standby time is minimized. The Departmental Representative is responsible for all costs associated with sample collection and analytical testing and written reporting of verification testing results..
  - .1 The Contractor shall allow for five (5) days for rush analysis results of confirmation of closeout samples.

**3.2 CONSTRUCTION METHODOLOGY**

- .1 LTU Construction (as per Landfarm Treatment Unit Design shown on Figure 2):
  - .1 Strip 0.35 m thick surficial soils within the LTU location and grade for liner bedding placement. Striped top soil materials shall be temporarily stockpiled in a designated location in proximity to the LTU location.
  - .2 Stockpiled soil materials and locally available soil materials shall be used to build the soil berm along the LTU perimeters. Stockpiled backfill soils shall be tested (frequency: 1 per 500 m<sup>3</sup>) prior to use and analytical parameters should be confirmed to be below CCME Commercial Land Use Guidelines. The slope of the soil berm shall be 1.5H: 1V.
  - .3 The interior dimensions of the base of the LTU are 130 m by 130 m as per Figure 2 of this tender package.
  - .4 The LTU shall be graded to slope down to a LTU low corner where a leachate collection point will be constructed.

- .5 A 300 mm (12 inch) diameter PVC pipe shall be installed at the base of the leachate collection point to allow for pumping percolated water, if needed. The PVC pipe shall be at least 1.0 m in length with a 0.5 m long slotted screen section.
- .6 Place single-sided textured HDPE Geomembrane within the LTU as indicated on Figure 2 of this tender package. The textured side of the liner shall be the walking surface to reduce slippery hazard. The liner shall extend over the perimeter of the LTU soil berms.
- .7 Granular Fill (for LTU construction),  $\frac{3}{4}$ "(20mm) crush or an alternate approved by the Department Representative's Authorized Personnel, will be placed on top of the liner with a minimum depth of 0.25m as per Figure 2 LTU design.
- .8 Place contaminated soil within the indicated placement boundary limits. Procedures for soil placement should be such that aeration of the soil is maximized during initial placement.
- .9 Place rock cobbles (100 to 300 mm diameter) on exposed liner to secure it to existing ground and berm.
- .2 Contaminant Soil Excavation and Backfilling
  - .1 The location for soil excavation at the FTA Area (approximately 7620 m<sup>3</sup>) will be located on the west end of the airport runway. (See Figure 1 for FTA soil excavation area).
  - .2 Prior to the commencement of any excavations activities, the proposed excavation location areas shall be surveyed to establish initial ground level conditions.
  - .3 All contaminated soil with the FTA Area exceeding the Canadian Council Minister of the Environment (CCME) Commercial Land (CL) guidelines shall be excavated. All excavated soil shall be immediately transported and placed within the LTU. No excavated contaminated soil shall be temporarily stockpiled at any locations on the site.
  - .4 When the excavation of contaminated soil approaches the suspected boundary where concentrations of regulated parameters are less than CCME CL guidelines, verification samples shall be collected for analytical testing. It is proposed to perform the verification sampling in sequential stages around the perimeter and base of the excavation such that standby time is minimized. It will be the responsibility of the Departmental Representative's Authorized Personnel to conduct confirmatory sampling of the soil excavation areas, prior to commencing backfill activities.
    - .1 The Contractor shall allow for five (5) days for rush analysis results of confirmation of closeout samples.
  - .5 Once it has been verified that all soil above CCME CL guidelines has been excavated, the final volume of all excavated shall be surveyed. No backfilling procedures shall begin until the results of the survey are reviewed and approved by the Departmental Representative.
  - .6 All excavated areas shall be backfilled to the initial site conditions and be graded to allow drainage. The backfill material should be selected from locally available materials and the backfill of excavations at the FTA area should conform to pre-excavation conditions.

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CAMBRIDGE BAY AIRPORT  
FIRE TRAINING AREA REMEDIATION  
CAMBRIDGE BAY AIRPORT, NUNAVUT

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**END OF SECTION**

**Part 1        General**

**1.1           SUBMITTALS**

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

**1.2           REQUIREMENTS**

- .1        Shore and brace excavations, protect slopes and banks and perform work in accordance with Territorial regulations.
- .2        Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

**1.3           PROTECTION**

- .1        Prevent damage to benchmarks, existing buildings, surface or underground service or utility lines which are to remain. Immediately repair any damage to the above or replace the above in the event of damage, at no cost to Departmental Representative.
- .2        Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage
- .3        Environmental protection measures are to be in accordance with the requirements specified in Section 01 35 43 - Environmental Procedures.

**1.4           MEASURE OF PAYMENT**

- .1        No measurement for payment will be made for:
  - .1        Rejected material.
  - .2        Surplus material.
  - .3        Excavation, and stripping and replacement of organic material beyond specified limits.
  - .4        Placement of granular fill beyond the limits and depths specified, unless specifically authorized by Departmental Representative.
- .2        Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 31 00 00 of BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

**Part 2        Products**

**2.1        MATERIALS**

- .1        Fill Materials, for the FTA excavation, consists of non-contaminated soil materials with same physical properties as excavated soil materials.

**Note:** Typical soil conditions encountered during the Work will be silty sands with an average soil density of 1.6 throughout, as described in the Tender Package supporting documents.

- .2        Granular Material for the HDPE bedding is to be sand or 20mm minus or a Departmental Representative's Authorized Personnel approved alternative.

**Part 3        Execution**

**3.1        PREPARATION**

- .1        Protect excavations from freezing.
- .2        Keep excavations clean, free of standing water, and loose soil.
- .3        Where soil is subject to significant volume change due to change in moisture content, cover and protect for Departmental Representative's Authorized Personnel approval.

**3.2        CLEARING AND GRUBBING**

- .1        Remove exposed boulders and debris.
- .2        Dispose of cleared and grubbed material off site daily to disposal areas acceptable to authority having jurisdiction.

**3.3        EXCAVATION**

- .1        Establish lines and levels, locate and lay out, by instrumentation.
- .2        Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
- .1        Stockpile topsoil on site for later use.
- .3        Excavate as required to carry out work.
- .1        Do not disturb soil or rock below bearing surfaces.
- .2        Notify Departmental Representative or Departmental Representative's Authorized Personnel when excavations are complete.
- .3        If, after excavating any contaminated soil, the exposed surface does not have sufficient bearing strength to support the backfill as required for

Section 3.5.1, additional excavation will be authorized in writing and paid for as additional work.

- .4 Stake for grading and fill.
- .5 Stake slopes and berms.

### **3.4 STOCKPILING**

- .1 Stockpile fill materials in areas designated by Departmental Representative's Authorized Personnel.
  - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

### **3.5 BACKFILLING**

- .1 Backfilling of the FTA area shall be completed in a manner to restoring site surface to pre-project conditions and be graded to allow drainage. Backfill of excavation at FTA area should conform to pre-excavation conditions.
- .2 Backfill material used for the FTA area excavation need to be submitted for laboratory analysis so that it is confirmed it meets CCME CL criteria. This will be approved by the Departmental Representative's Authorized Personnel before the backfill material is brought on site, or it will be removed at the contractors cost.
- .3 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by Departmental Representative's Authorized Personnel.
- .4 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .5 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .6 Placing:
  - .1 Place backfill, for the FTA area, fill and base-course material in 150 mm lifts: add water as required to achieve specified density.
  - .2 Pace Granular Material for the LTU to a depth of 0.25m across the surface of the LTU as shown in Figure 2.
  - .3 Place Sand (20mm minus) bedding for the Geomembrane to a depth of 0.15m across the surface and the berm of the LTU as shown in Figure 2.

### **3.6 GRADING**

- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by the Departmental Representative's Authorized Personnel.



- .1 Grade to be gradual between finished spot elevations shown on drawings.
- .2 Grading for the LTU will conform to Figure 2.
- .3 Grading to be staked by instrumentation.

### **3.7 CLEANING**

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

**END OF SECTION**

## 1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM D1004- [94a (2003)], Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
  - .2 ASTM D1204- [02], Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.
  - .3 ASTM D1238- [01e1], Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
  - .4 ASTM D1603- [01], Standard Test Method for Carbon Black in Olefin Plastics.
  - .5 ASTM D5994-98, Standard Test Method for Measuring Core Thickness of Textured Geomembrane.
  - .6 ASTM D6693 – 04 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.
  - .7 ASTM D4833 – 07 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
  - .8 ASTM D7446 - 09 Standard Specifications for Structural Insulated Panel (SIP) Adhesives for Laminating Oriented Strand Board (OSB) to Rigid Cellular Polystyrene Thermal Insulation Core Materials.
  - .9 ASTM D1505 - 10 Standard Test Method for Density of Plastics by the Density Gradient Technique.
  - .10 ASTM D5397 - 07 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.

## 1.2 QUALITY ASSURANCE

- .1 Test quality of resin and membrane to ensure consistency of raw material and geomembrane quality in accordance with manufacturer's recommendations.
- .2 Test seams in strength and peel at beginning of each seaming period, and at least once every 4 h if welding operation is interrupted, for each seaming apparatus and seamer used that day. Also test at least two samples from each panel, with samples taken from extra material, such that panel is not damaged and blanket geometry is not altered.
- .3 If seam test specimen fails in seam, repeat on new specimen. If new specimen fails in seam, material will not be used for seaming until deficiencies are corrected and two consecutive successful test seams are achieved.
- .4 Test seams by non-destructive methods over their full length, using vacuum test unit or air pressure test.
  - .1 Vacuum chamber to contain glass viewport and seal for sealing chamber to seam area. With chamber sealed in place and after partly filling

chamber with water, apply vacuum of 17.2 kPa. Seam failure is detected by presence of air bubbles through water.

- .2 Use air lance to apply air at 343 kPa through nozzle directed at edge of overlap seam. Seam failure is indicated by inflation or lifting of any part of geomembrane.
- .5 Provide test results to Departmental Representative's Authorized Personnel for each shift's production, including documentation of non-destructive testing and repairs at the end of each shift.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 During storage and handling, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
- .2 The Departmental Representative has arranged for the geomembrane to be delivered in Cambridge Bay via barge and shall be delivered to the site (by others).
- .3 Availability of geomembrane may be subject to barge schedule.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Fold up metal banding, flatten and place in designated area for recycling.

### **1.5 MEASUREMENT OF PAYMENT**

- .1 The direct costs to install the geomembranes for the FTA LTU will be measured for payment by lump sum under item 31 32 19.02.
- .2 Owner shall purchase geomembrane and transport to the adjacent LTU lay down area.
- .3 Except as otherwise indicated, work under this section will not be measured. Include all costs in Item 31 32 19.02 BOPC-1, Balance of Project Costs in the Basis of Pricing Schedule.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Geomembrane (provided by Departmental Representative): extruded synthetic sheet.
  - .1 Supplied in:
    - .1 Rolls of 6.9 m minimum width.
    - .2 Composed of high density polyethylene.
- .2 Physical properties of geomembrane (provided by Departmental Representative):

- .1 Sheet Density to ASTM D1505 minimum 0.94 g/cm<sup>3</sup>.
  - .2 Melt index of resin: to ASTM D1238, Condition 190/2.16 (max), 1.0 g/10 min.
  - .3 Thickness: to ASTM D5994, minimum average 1.43 mm.
  - .4 Tensile strength and elongation at yield: to ASTM D6693.
    - .1 Tensile strength: minimum 22 N/mm.
    - .2 Elongation: minimum 12 %.
  - .5 Tensile strength and elongation at break: to ASTM D6693:
    - .1 Tensile strength: minimum 16 N/mm.
    - .2 Elongation: minimum 100 %.
  - .6 Tear resistance: to ASTM D1004, minimum average 187 N.
  - .7 Puncture resistance: to ASTM D4833, minimum average 400 N.
  - .8 Dimensional stability to ASTM D1204, +/- 2%.
  - .9 Carbon black content: to ASTM D1603, minimum 2%, maximum 3% by mass.
  - .10 Asperity Height to ASTM D7446 to 0.38 mm.
  - .11 Stress Crack Resistance (SP-NCTL) to ASTM D5397, 300 hr.
  - .12 Geomembrane: free of striations, roughness, pinholes, bubbles, blisters, un-dispersed raw materials and any sign of contamination by foreign matter.
- .3 Seams: welded in accordance with manufacturer's recommendations. Physical properties for resin used for welding to be same as those for resin used in manufacture of membrane.

## **2.2 CLEANING**

- .1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

## **2.3 PROTECTION**

- .1 Do not permit vehicular traffic directly on membrane.

## **Part 3 EXECUTION**

### **3.1 INSTALLATION**

- .1 Maintain area of installation free of water and snow accumulations.
- .2 Prepare excessively soft supporting material as directed by Departmental Representative's Authorized Personnel.
- .3 Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (eg. fog, dew), nor in presence of high winds.

- .4 Place and seam panels in accordance with manufacturer's recommendations on graded surface in orientation and locations indicated. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.
- .5 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.
- .6 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative' Authorized Personnel. Remove rejected damaged panels from site.
- .7 Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.
- .8 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.
- .9 Make field seam samples in accordance with requirements described in Section 2.1 PART 2 on fragment pieces of geo-membrane and test to verify that seaming conditions are adequate.
- .10 Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.
- .11 Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

**END OF SECTION**

# **DRAWINGS**



HAMLET  
OF  
CAMBRIDGE BA

04  
01

PROPOSED LTU LOCATION

FTA AREA

03  
-

SITE LOCATION

1:25000

04  
-

SITE PLAN

1:5000

PROPOSED LTU LOCATION

FTA AREA



PROJECT

FIRE TRAINING AREA  
REMEDATION

PROJECT NO.

13-7423

TITLE

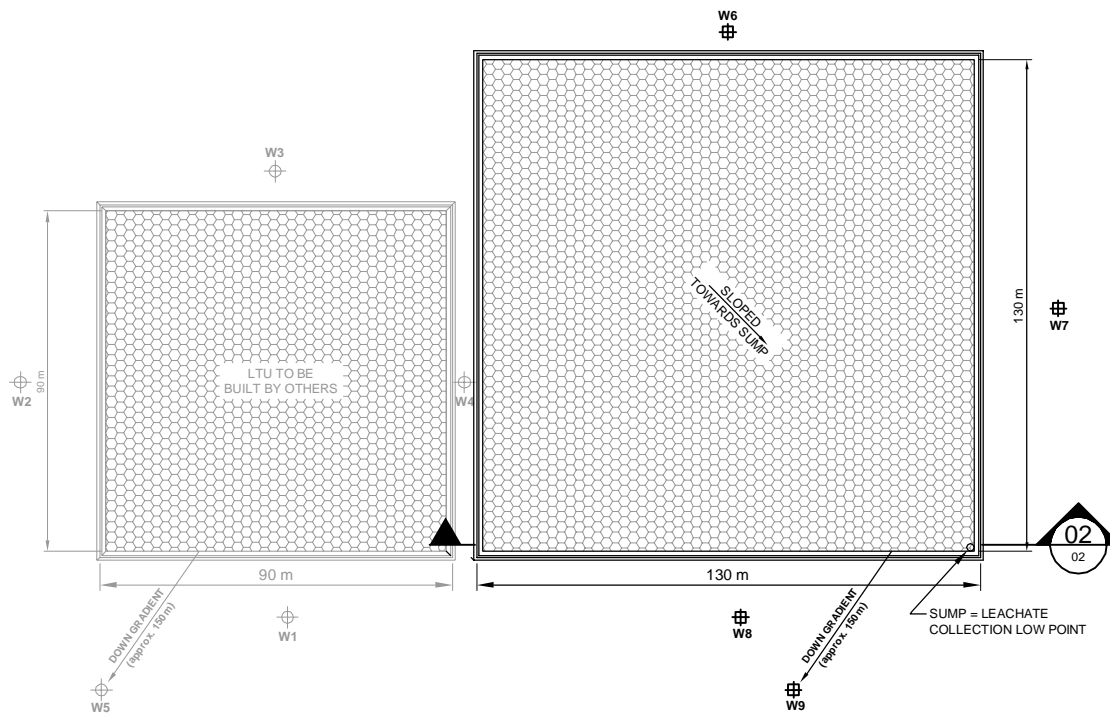
SITE LOCATION  
AND SITE PLAN

FIGURE NO.

FIGURE 1

DATE

MAY 2013

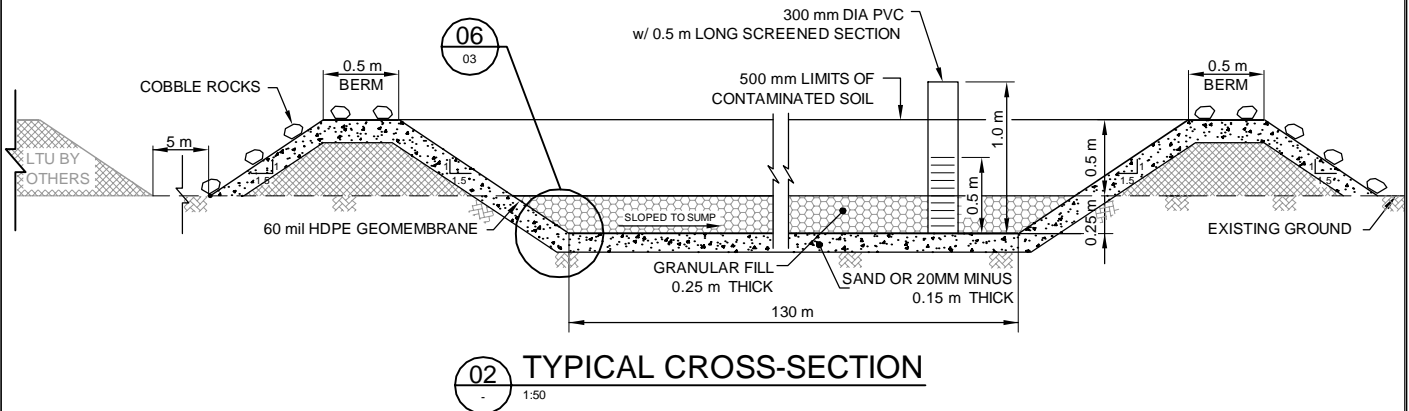


#### LEGEND

- GROUNDWATER MONITORING WELL
- GROUNDWATER MONITORING WELL BY OTHERS

#### PLAN OF FTA LTU

1:2000



#### TYPICAL CROSS-SECTION

1:50



PROJECT

FIRE TRAINING AREA  
REMEDATION

PROJECT NO.

13-7423

TITLE

LANDFARM TREATMENT UNIT  
(LTU) DESIGN

FIGURE NO.

FIGURE 2

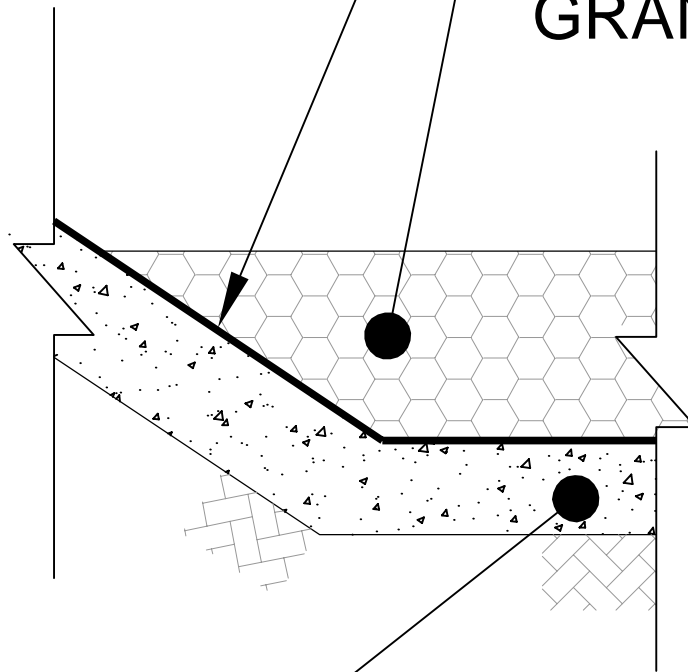
DATE

MAY 2013



60 mil HDPE  
GEOMEMBRANE

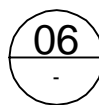
250 mm  
GRANULAR FILL



150mm SAND  
OR 20mm MINUS

LEGEND

GEOMEMBRANE



LTU DETAIL

1:10



PROJECT

FIRE TRAINING AREA  
REMEDICATION

PROJECT NO.

13-7423

TITLE

DETAIL

FIGURE NO.

FIGURE 3

DATE

MAY 2013

**PHOTOS**

CAMBRIDGE BAY AIRPORT, VICTORIA ISLAND, NUNAVUT  
FIRE TRAINING AREA SITE PHOTOS



Photo 1. Fire Training Area – view northeast



Photo 2. Fire Training Area view south



CAMBRIDGE BAY AIRPORT, VICTORIA ISLAND, NUNAVUT  
FIRE TRAINING AREA SITE PHOTOS



Photo 3. Fire Training Area view southeast



Photo 4. Fire Training Area view northeast

CAMBRIDGE BAY AIRPORT, VICTORIA ISLAND, NUNAVUT  
FIRE TRAINING AREA SITE PHOTOS



Photo 5. Fire Training Area view northeast