AutoCAD 2000. The closure report and all associated documents will also be submitted in PDF format, which can be viewed with Acrobat Reader 3.0 (or a more recent version of Acrobat Reader).

Final copies will be submitted to:

W.R. Ferguson, Manager
Transport Canada, Environmental Affairs
Prairie & Northern Region
P.O. Box 8550
3rd Floor, 344 Edmonton Street
Winnipeg, Manitoba R3C 0P6.

2.3 Sampling and Analysis

APPROACH TO EXCAVATION SAMPLING

Field Screening, Confirmatory Sampling and Analytical Testing for Soils

The Contractor will collect environmental soil samples from the areas of interest for testing and analytical analysis at an accredited laboratory to determine actual concentrations of contamination. The soil samples are to be taken as per industry standards, including QA/QC protocols. All samples will be submitted to a Canadian Association for Environmental Analytical Laboratories (CAEAL) and Standards Council of Canada (SCC) accredited laboratory. Please, refer to Appendix G for the sampling protocols of soil and groundwater, respectively.

A Photo Ionization Detector (PID) will be used for organic vapour measurement (OVM) testing. During the excavation process, headspace vapour tests will be conducted with the PID at a frequency of approximately 1 test per 25 m^3 of soil excavated. Samples will be retrieved from the excavation sidewalls and base after digging approximately 0.2 m into the excavation face and collecting approximately 1 kg of soil from the hand-dug pit. The headspace vapour testing will involve collecting a discrete soil sample, placing it in a clean plastic bag and sealing the bag. The amount of sample in the bag should amount to approximately 50% by volume to provide adequate room for vapours in the headspace to accumulate. The sample will be allowed to reach an approximate temperature of 20°C ± 5°C before the sampling tip of the PID will be inserted into the bag, air drawn from the bag with the PID and a measurement of organic vapours emitted from the soil will be recorded. The field technician will record the sequential sample collection and headspace OVM on field data sheets.

It is expected that the excavations will be completed in sections. The excavation sections will be continued vertically until field screening techniques indicate that each section is complete. The excavation will be stepped out laterally until the field technician is confident that the OVM are consistently dropping with lateral progress. Once the field technician suspects that soil with concentrations above the applicable

industrial remediation criteria of GNWT and CCME have been removed, samples will be obtained for field chemical analysis using PetroFlag®. Should PetroFlag® results indicate that soils representative of those remaining on the sidewalls and base of the excavation are below applicable standards, confirmatory samples will be collected for analysis at an accredited laboratory. Obviously, where field screening techniques indicate that contamination above standard exists either laterally or vertically, the excavation would be continued in that direction. The combined use of the PID and PetroFlag® will result in a more efficient and accurate excavation process.

Once the excavation is considered complete based on OVM and PetroFlag® field screening tests, confirmatory soil samples will be retrieved from the excavation sidewalls and bases for laboratory testing. The method for confirmatory sampling of soils at the site will be generally consistent with guidelines developed by GNWT and CCME.

The confirmatory soil samples will be placed in pre-cleaned jars provided by the analytical laboratory. Samples will be stored and transported in insulated coolers with sufficient cold packs to maintain the interior temperature at approximately 4°C until the laboratory receives the samples. One (1) confirmatory soil sample will be obtained from each of the sidewalls and the base at the stockpile area and one (1) composite confirmatory soil sample will be obtained from the sidewalls and base at each of the five surface stained areas. Table 5 indicates the sampling and analysis requirements for the work area at Iqaluit Airport:

Table 5: Soil Sampling Methodology at Iqaluit Airport

Site Location	*No. of Soil Samples Obtained from Excavation Sidewalls*	*No. of Soil Samples Obtained from Excavation Base*	*No. of Soil Samples Submitted to Laboratory*	*Analysis Required*
Stockpile area	2 composite samples	1 composite sample	3	BTEX, CCME Fractions #1-#4
Surface stained areas (5 areas)	1 composite sample per excavated area		5	BTEX, CCME Fractions #1-#4

BTEX = Benzene, toluene, ethyl benzene and total xylenes.

Each confirmatory soil sample will be tested for benzene, toluene, ethyl benzene and total xylenes (BTEX), and CCME petroleum hydrocarbon Fractions #1, #2, #3 and #4. The results of the laboratory analyses will be compared to the 2003 GNWT *Guideline for Contaminated Site Remediation* criteria for industrial sites, the 2003, CCME *Canadian Environmental Quality Guidelines* criteria for industrial sites and the 2001, CCME *Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil* for Fractions #1, #2, #3 and #4, Tier 1 criteria for eco-soil contact for the applicable soils (surface or subsoil) using the parameters for industrial sites. A sieve test will be conducted on a representative sample obtained from the impacted sites to determine the applicable

remediation criteria (fine-grained or coarse-grained soil). Tables 6 and 7 indicate the applicable remediation criteria for soil.

Table 6: Applicable GNWT Soil Remediation Criteria at Iqaluit Airport
(all concentrations are mg/kg)

Parameters	2003 GNWT Guideline for Contaminated Site Remediation of Industrial Sites			
	Fine-Grained Surface Soil, Industrial Tier 1 Levels	Coarse-Grained Surface Soil, Industrial Tier 1 Levels	Fine-Grained Subsoil (> 1.5 m depth), Industrial Tier 1 Levels	Coarse-Grained Subsoil (> 1.5 m depth), Industrial Tier 1 Levels
Benzene	5			
Toluene	0.8			
Ethyl benzene	20			
Xylene	20			
F1 (C6-C10)	660	330	1000	700
F2 (C10-C16)	1500	760	3000	2000
F3 (C16-C34)	2500	1700	5000	3500
F4 (C34-C50)	6600	3300	10,000	10,000

Table 7: Applicable CCME Soil Remediation Criteria at Iqaluit Airport
(all concentrations are mg/kg)

Parameters	2003 CCME Environmental Quality Guidelines for Soil at Industrial Sites	2001 CCME Canada-Wide Standards for Petroleum Hydrocarbons in Fine-Grained Surface Soil, Industrial Tier 1 Levels	2001 CCME Canada-Wide Standards for Petroleum Hydrocarbons in Coarse-Grained Surface Soil, Industrial Tier 1 Levels	2001 CCME Canada-Wide Standards for Petroleum Hydrocarbons in Fine-Grained Subsoil (> 1.5 m depth), Industrial Tier 1 Levels	2001 CCME Canada-Wide Standards for Petroleum Hydrocarbons in Coarse-Grained Subsoil (> 1.5 m depth), Industrial Tier 1 Levels
Benzene	5	N/V	N/V	N/V	N/V
Toluene	0.8	N/V	N/V	N/V	N/V
Ethyl benzene	20	N/V	N/V	N/V	N/V
Xylene	20	N/V	N/V	N/V	N/V
F1 (C6-C10)	N/V	660	330	1000	700
F2 (C10-C16)	N/V	1500	760	3000	2000
F3 (C16-C34)	N/V	2500	1700	5000	3500
F4 (C34-C50)	N/V	6600	3300	10,000	10,000

Applicable remediation criteria will be determined based upon site conditions.
N/V = No Value.

Groundwater Sampling

If groundwater is encountered during excavation, a water quality testing program will be conducted, which will include analysis at an accredited laboratory. The Contractor will collect water samples from each excavation. All of the samples will be submitted to an accredited laboratory for analysis of BTEX and lead. The results of the water analyses will be compared to the freshwater remediation criteria of the 2003 CCME *Canadian*

Environmental Quality Guidelines. Table 8 indicates the applicable water remediation criteria.

Table 8: Applicable CCME Water Remediation Criteria
(all concentrations are µg/L)

Parameters	*2003 CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life*
Benzene	370
Toluene	2.0
Ethyl benzene	90
Xylene	N/V
Lead	1-7

2.4 Project Schedule and Duration

Figure 7 outlines the project milestones with proposed time allotment for the completion of all project elements. The dates indicated are somewhat arbitrary and may change depending upon TC' s time-line and site conditions. Site remediation will be conducted during a two-week period in June 2005.

3.0 MANAGEMENT PROPOSAL

3.1 Contractor' s Qualifications

WERI Corporate Background

WERI, a wholly Canadian-owned company, has been providing comprehensive environmental services to a variety of clients in both the private and public sector throughout Canada, including TC. The company offers a wide range of environmental services from professional environmental assessments and audits to site remediation services and the construction of containment facilities. The history of the company' s experience prior to its present form is well grounded in specialty construction services. Since 1995 the work has focused on specifically providing environmental consulting and construction services.

The key to being able to provide such a wide range of services for clients has been the incorporation of a team approach to all projects. WERI has successfully created partnerships and relationships with over 30 environmental specialists to offer clients a turn-key solution for environmental remediation. The project managers, demolition and construction experts and technicians employed by WERI reflect more than a decade of relevant experience in the environmental, construction and agricultural fields. This experience includes planning, organizing and implementing practical solutions to a vast array of environmental and construction problems.

WERI offers a full range of services in the following fields:

- Environmental remedial works projects.

- Environmental construction activities.
- Environmental decommissioning and demolition works.
- Disposal of contaminated and hazardous waste.
- Specialty construction works.
- Environmental site restoration and landscaping.
- Environmental Site Assessments (ESAs) and Environmental Site Investigations (ESIs).
- Environmental testing and analysis.

WERI' s headquarters is in West St. Paul, Manitoba on the outskirts of Winnipeg, Manitoba with branch facilities in Olds, Alberta and MacNutt, Saskatchewan. The company has been involved in projects throughout Canada and has extensive experience effectively working in remote areas such as the Iqaluit region.

WERI, as a full service, multidisciplinary environmental construction, demolition and remediation firm, brings sufficient staff resources, corporate experience and financial stability to meet the requirements of this project. We are fully aware of the environmental and workplace safety legislation at the federal, provincial, territorial and local levels of government. We keep abreast of the latest developments in environmental protection through regular contact with regulations authorities, environmental courses, technical meetings and networking with other environmental professionals.

The WERI Project Team provides services for all aspects of site remediation and investigation including:

- Conducting ESAs.
- Building material audits.
- Remedial investigation.
- Environmental construction studies and remedial construction.
- WHMIS reviews and updates.
- Environmental surveys.
- Recycling programs.
- Sewage and bulk waste design/building, engineering, planning and management.
- Asbestos management strategies.
- Mould abatement.
- Site planning for future development in environmentally sensitive areas.
- Risk assessment.
- Quality assurance programming.
- Contaminant delineation, volume estimation and remedial option design/evaluation.
- Environmental sampling.
- Geotechnical drilling and monitoring well services.
- Land use and Environmental Planning.
- Waste site decommissioning services.
- Secondary containment design and construction for various hazardous materials.

- Hazardous and contaminated waste disposal.
- Environmental demolition and decommissioning projects.
- Site restoration.
- General contracting demolition services on hazardous waste projects including asbestos, polychlorinated biphenyls (PCBs), chlorofluorocarbons (CFCs) and urea formaldehyde foam insulation (UFFI).
- Sewage system installation.
- In-house design and manufacture of secondary containment and soil and groundwater treatment programs.

Client Base

WERI has provided environmental assessments, building demolition, environmental construction services, environmental decommissioning, sewer and water design and installation, soil sampling, project management, tank decommissioning services, Land Treatment Unit (LTU) construction, various hydrocarbon remedial technologies, remediation cell construction and liner installation services for the following clients:

- Transport Canada (>30 projects)
- Nav Canada (13 projects)
- Department of National Defence
- Health Canada
- City of Brandon
- Public Works & Government Services Canada
- City of Winnipeg
- Elite Swine
- DGH Engineering Limited
- Liberty Oil
- Winnipeg Pan-Am Games Society
- Manitoba Public Works
- Manitoba Hydro
- Northern Affairs
- Saber Industries
- Northland Petroleum Limited
- ENG-TECH Consulting Limited
- KGS Engineering
- Wardrop Engineering
- First Nations communities
- Standard Aerospace
- Bristol Aerospace
- Safeway Canada
- Manitoba Highways
- Manitoba Telecom Services
- Mikkelsen-Coward

The Contractor has developed a customized Project/Construction Management System for Federal Government projects. This system has been standardized to provide consistent service to clients such as TC. The Project/Construction Management System is comprised of the following specializations:

1. Purchasing.
2. Material sourcing.
3. Budget take-offs and control criteria.
4. Specifications/Design.
5. Regulatory compliance, codes and guideline interpretation.
6. Expediting services and product verification service.
7. Centralized construction management.

Professional Memberships & Certificates

The Contractor, subcontractors and professionals selected for the remediation project at Iqaluit Airport hold the following memberships and certificates:

Memberships

- Manitoba Environmental Industries Association Incorporated (MEIA).
- Canadian Environmental Industries Association Incorporated (CEIA).
- Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM).
- Professional Engineers of Ontario (PEO).
- Associated Environmental Site Assessors of Canada (AESAC).
- Manitoba Heavy Construction Association.
- Coalition for Safer Waters.
- Royal Life Saving Society.
- Regional Boating Advisory Committee for the Canadian Coast Guard.
- International Erosion Control Association (IECA).
- Ontario Landscape Association.
- North American Storm Water and Erosion Control Association.

Certificates and Courses

- Petroleum Tank Installation Certificate in Saskatchewan, Alberta, Manitoba and Northwest Territories and Yukon Territory.
- Petroleum Technician Training Course.
- APEGM Hydrocarbon Remediation Technologies In-Situ and Ex-Situ Treatment.
- Government of Manitoba Emergency Disaster Media Relations.
- AESAC Phase 1 Environmental Site Assessor.
- EPIC Level 2 Environmental Site Assessment and Remedial Strategies.
- Winnipeg Police Service Public Safety Training.
- City of Winnipeg Hazardous Materials Handling.
- Forest Fire Emergency Preparedness.
- Department of Fisheries and Oceans (DFO) Sediment Control Seminar.
- Certified Professional in Erosion and Sediment Control (CPESC).

- Synthetic Liner Installation.
- Quality Control and Materials Testing for Geomembrane Covers and Liners.
- Certificate of Recognition (COR).
- Conference for the Treatment of Contaminated Soils in Arctic Environments.

The Corporate Profile of WERI is available in Appendix H.

3.2 Project Personnel

The Contractor has assigned the following personnel for the completion of the LTU management program[§]:

Miles Antony	Project Manager, LTU Construction/Maintenance Specialist
Dennis Antony, B.Sc., R.R.D., CPESC	Alternate PM, Environmental Scientist, Safety Officer
Art Brown	Construction Supervisor
Clark Hryhoruk, M.Sc., P.Eng.	Environmental Engineer
Arthur Magri, B.Sc.	Environmental Technician
Victor Lee, M.L.A., CPESC	Landscape Architect, Erosion Control Specialist

[§]CVs of each team member are included in Appendix I.

Miles Antony—Project Manager~LTU Construction/Maintenance Specialist

Miles Antony is the General Manager of WERI. Mr. Antony has more than ten years of experience in hydrocarbon remediation, geomembrane installation, construction and project management. As the Project Manager, he will have all the responsibility for technical, financial, project management and construction aspects of the project. As well, he will ensure that the resources of the firm are applied in a timely and efficient manner so that all project schedules are met.

Mr. Antony has been in charge of the successful remediation of more than 250,000 m^3 of petroleum hydrocarbon contaminated soil, including hazardous waste, in a variety of locations across the country. Mr. Antony has project management experience with environmental construction and decommissioning projects including Underground Storage Tanks (USTs), FTAs, landfill sites, bioremediation facilities, hazardous waste management sites, land waste treatment facilities and sewage lagoon projects. Mr. Antony also brings extensive knowledge in the field of general operating practices, procedures and policies of federal, provincial and municipal environmental practices. Additionally, Mr. Antony has achieved certification for geomembrane installation from Layfield Geosynthetics of Canada.

The following is a partial list of projects where Mr. Antony was involved as Project Manager/Site Supervisor ranging from $25,000.00 - $750,000.00 in budget.

1. Norman Wells, Northwest Territories	• Commissioned an LTU with an Arctic Liner® for the treatment of petroleum hydrocarbon contaminated soil. • Excavated 2500 m^3 of petroleum hydrocarbon contaminated soil from the Nav Canada site.
2. Inuvik, Northwest Territories	• Commissioned a two-celled LTU with an Arctic Liner® for the treatment of petroleum hydrocarbon contaminated soil. • Excavated 2000 m^3 of petroleum hydrocarbon contaminated soil from the Nav Canada site.
3. Whitehorse, Yukon Territory	• Commissioned an LTU with geomembrane liner for the treatment of petroleum hydrocarbon contaminated soil. • Removed 8000 m^3 of petroleum hydrocarbon contaminated soil from the Yukon Transportation Museum. • Installed an Enviro Curtain adjacent to the Yukon Transportation Museum.
4. Churchill, Manitoba	• Commissioned three (3) LTUs complete with geomembrane liners for the treatment of petroleum hydrocarbon contaminated soil. • Excavated 19,000 m^3 of petroleum hydrocarbon contaminated soil from various sites at Churchill Airport and the Port of Churchill. • Treated 900,000 L of petroleum hydrocarbon contaminated groundwater.
5. Brandon, Manitoba	• Built a landfill site refuse holding cell. • Installed drainage and sump system. • Supplied and installed a 60 mil high density polyethylene (HDPE) liner.
6. Elie, Manitoba	• Supplied and installed three different types of geomembrane covers for the protection of hay stacks. • Installed a negative air pressure system to keep covers in place.
7. Oxford House, Manitoba	• Decommissioned Manitoba Hydro tank farm.
8. Dauphin, Manitoba	• Decommissioned a large landfill site at Dauphin Airport. • Decommissioned an FTA. • Developed and implemented Hazardous Waste Material and Ozone Depleting Substances (ODS) strategies. • Established an LTU. • Installed groundwater monitoring wells.
9. The Pas, Manitoba	• Designed and implemented a waste oil storage area at The Pas Airport. • Decommissioned three landfill sites. • All decommissioned landfill sites were engineered to promote positive water drainage.
10. Saskatoon, Saskatchewan	• Excavated 7000 m^3 of petroleum hydrocarbon contaminated soil. • Established an LTU.
11. Winnipeg, Manitoba	• Established a PCB storage site at Winnipeg International Airport. • Decommissioned a PCB storage site. • Decommissioned the FTA including several large fuel tanks (10,000 gallon capacity).
12. Lethbridge, Alberta	• Prepared a subsurface geotechnical analysis for hydrocarbon contamination at Lethbridge Airport. • 9300 m^3 of contaminated soil excavated and placed in LTU.
13. La Ronge, Saskatchewan	• Prepared an historical environmental review of La Ronge Airport. • Decommissioned the FTA. • Excavated contaminated soil and placed in LTU.
14. Iqaluit, Nunavut	• Decommissioned FTA at Iqaluit Airport. • Established LTU with geomembrane liner.
15. Yellowknife, Northwest	• Project management of petroleum hydrocarbon remediation project at

Territories	Yellowknife Airport. • Developed and conducted LTU Management Program including tilling of contaminated soil and confirmatory soil sampling.
16. Saskatoon, Saskatchewan	• Commissioning of an LTU with dimensions of 200 x 50 m. • Installation of Arctic Liner® on the base of the LTU. • Excavated 15,000 m³ of petroleum hydrocarbon contaminated soil from the FTA.

Dennis Antony (B.Sc., R.R.D., CPESC)—Alternate Project Manager~Environmental Scientist~Safety Officer

Dennis Antony has worked as an environmental/biological scientist in various parts of Canada since 1982. He has been responsible for field operations, designing site-specific biological fisheries field sampling programs, environmental remediation action plan contract administration, baseline/site audit studies, compliance reviews, project management roles, ESIs, client liaison, pollution inspection service, land use inspector services and risk assessments studies.

As regulatory compliance officer, Mr. Antony will be responsible for any environmental, occupational health, fire safety and other legislative issues, plans or research required for the remediation project. Having conducted numerous remediation projects in the Northwest Territories, Mr. Antony is very familiar with the environmental remediation guidelines and soil remediation criteria of GNWT and CCME. Mr. Antony has over fifteen years of regulatory compliance experience as a regulator for federal, provincial and civic jurisdictions.

Mr. Antony was the Project Manager at Fort Good Hope in 2003, where he commissioned an LTU with an Arctic Liner® for the containment of petroleum hydrocarbon contaminated soil. Mr. Antony also supervised the removal of approximately 350 m^3 of petroleum hydrocarbon contaminated soil from the Nav Canada site. Additionally, Mr. Antony has designed and is currently managing a study on behalf of TC at Resolute Bay Airport that has been designed to assess and evaluate different remedial techniques in arctic environments.

Art Brown—Construction Supervisor

Art Brown has more than thirty-five years experience in the supervision, operation and repair of heavy equipment used in construction, demolition, excavation and environmental remediation projects. Mr. Brown has been a supervisor on demolition projects, asbestos and mould abatement projects and excavation projects. He has supervised projects ranging in budget from $10,000- $2,000,000. Mr. Brown will be the operator during the excavation of contaminated soil and during the construction of the LTU. Additionally, Mr. Brown' s role during the remedial project will be to organize equipment and control equipment traffic. He will be responsible for maintaining communication with airport authorities, the TCPM and equipment operators to ensure that traffic will not interfere with airport activity. Mr. Brown is certified in asbestos

abatement, WHMIS, TDG and first-aid. A short list of projects that Mr. Brown has supervised with activities very similar to those required at Iqaluit Airport includes:

Norman Wells, Northwest Territories	• Excavation of 2500 m³ of petroleum hydrocarbon contaminated soil. • Construction of an 80 x 30 m LTU to contain the contaminated soil. • Installation of an Arctic Liner® at the LTU site supplied by Layfield Geosynthetics Canada, including field seaming with a wedge welder. • Installation of a geomembrane curtain in the excavation adjacent to the NDB building.
Inuvik, Northwest Territories	• Excavation of 2000 m³ of petroleum hydrocarbon contaminated soil. • Construction of a 100 x 30 m LTU to contain the contaminated soil. • Installation of an Arctic Liner® at the LTU site supplied by Layfield Geosynthetics Canada, including field seaming with a wedge welder. • Installation of a geomembrane curtain in the excavation adjacent to the NDB building.
Churchill, Manitoba	• Excavation of 19,000 m³ of petroleum hydrocarbon contaminated soil. • Construction of a three LTUs lined with an oil resistant polyethylene liner to contain the contaminated soil. • Groundwater treatment of 1,000,000 L of petroleum hydrocarbon contaminated water with an oil/water separator.
Saskatoon, Saskatchewan	• Excavation of 15,000 m³ of petroleum hydrocarbon contaminated soil, including hazardous waste, from the FTA. • Construction of a 200 x 50 m LTU with an Arctic Liner®

Clark Hryhoruk (M.Sc., P.Eng.)—Environmental Engineer

Clark Hryhoruk has worked in geotechnical/environmental engineering in Manitoba since 1994. He has been responsible for the field operations, design works, report preparations, project management, client liaison and contract administration on numerous projects relating to both geotechnical and environmental engineering. Mr. Hryhoruk has also been involved in training field staff and office personnel in the above-related projects. In 1999, Mr. Hryhoruk was one of the principals who started ENG-TECH Consulting Limited and he is the acting President of the company.

Currently, Mr. Hryhoruk is corroborating with Dennis Antony on the LTU management study being conducted by WERI and ENG-TECH in Resolute Bay. Mr. Hryhoruk designed and developed the study, and he is responsible for analysis of sampling results obtained from three LTUs that are undergoing different treatment methodologies. Ultimately, the study will determine which treatment methodology provided the most benefits and which provided the most cost-efficiency for the client.

Arthur Magri (B.Sc.)—Environmental Technician

Arthur Magri has worked in an array of environmental fields, which has included community ecology, promoting land stewardship and environmental remediation. Mr. Magri has been responsible for the administration of several large scale remediation and investigation projects since joining WERI. Mr. Magri is familiar with the regulatory criteria of GNWT and CCME and he will be responsible for conducting soil and water

sampling. Mr. Magri will also be responsible for the writing and preparation of the draft and final reports, which will include providing detailed drawings of site plans.

Victor Lee (M.L.A., CPESC)—Landscape Architect-Erosion Control Specialist

Victor Lee' s professional experience as a landscape architect is well grounded in land stewardship including erosion control. Mr. Lee' s background is balanced between theoretical, professional and practical experience. His theoretical background includes a Masters Degree in Landscape Architecture, completion of ESA and erosion and sediment control courses and service as a faculty member of the Department of Architecture at North Dakota State University. Mr. Lee' s professional experience includes work as senior project manager on large scale projects in Toronto, Brampton and Cincinnati and a subcontractor on several remedial projects. Mr. Lee is a professional member of the International Erosion Control Association (IECA).

3.3 Related Projects

The following describes five projects with activities very similar to the work required at Iqaluit, including liner installation:

Project 1:	John G. Diefenbaker Airport
Location:	Saskatoon, Saskatchewan
Date:	2004 (on-going)
Description:	The Contractor excavated 15,000 m^3 of petroleum hydrocarbon contaminated soil from the former FTA. Some of the material excavated also included hazardous waste. An LTU with dimensions of 200 x 50 m was also commissioned by the Contractor to contain the excavated material. The excavated area was backfilled with 16,000 m^3 of clean fill, compacted and graded to pre-existing conditions. LTU management will be conducted by the Contractor beginning in the 2005 field season. Anticipated completion date is 2007.
Client:	Transport Canada
Budget:	$700,000
Project 2:	Resolute Bay Airport
Location:	Resolute Bay, Northwest Territories

Date:	2002 (on-going)
Description:	Four different hydrocarbon treatment methodologies were developed to determine the most viable management plan for LTUs in arctic environments. The study is comparing ex-situ natural attenuation, the addition of nutrients, the use of a heated biopile with a cover, and an aggressive mechanical aeration and bioremediation with nutrients and surfactants. The Contractor commissioned two two-celled LTUs lined with a geomembrane liner to contain the contaminated soil used in the study. The results of the study will eventually be presented in a paper to Transport Canada. The study will conclude in 2005.
Client:	Transport Canada
Budget:	$250,000

Project 3:	Churchill Airport
Location:	Churchill, Manitoba
Date:	2002-2004
Description:	Approximately 19,000 m^3 of petroleum hydrocarbon contaminated soil was excavated from various locations at Churchill Airport by the Contractor in 2002. The contaminated soil was placed in three LTUs commissioned by the Contractor. Each LTU was lined with a geomembrane liner. WERI in conjunction with ENG-TECH developed an LTU Management Manual for the airport personnel to manage the contaminated soil in the LTUs. In 2004, staff from WERI and ENG-TECH presented the contents of the manual to the airport personnel at a two-day training course. Field techniques were also conducted in the field by airport personnel under the supervision of WERI and ENG-TECH.
Client:	Transport Canada
Budget:	$650,000

Project 4:	Norman Wells Airport
Location:	Norman Wells, Northwest Territories
Date:	2003

Description:	The Contractor commissioned an LTU capable of holding 2500 m^3 of petroleum hydrocarbon contaminated soil. The LTU was lined with an Arctic Liner® supplied by Layfield Geosynthetics of Canada and installed by WERI field technicians. Three groundwater monitoring wells were commissioned at the LTU site. Approximately 2500 m^3 of petroleum hydrocarbon contaminated soil was excavated from the Nav Canada site at Norman Wells Airport and placed in the LTU. Field screening and confirmatory sampling during excavation was conducted by the Contractor.
Client:	Transport Canada
Budget:	$200,000

Project 5:	Iqaluit Airport
Location:	Iqaluit, Northwest Territories
Date:	1999-2000
Description:	The Contractor excavated 9000 m^3 of petroleum hydrocarbon contaminated soil from the former FTA and placed contaminated material in the lined LTU, also commissioned by WERI. The excavated area was backfilled with 10,000 m^3 of clean fill, compacted and graded to pre-existing conditions.
Client:	Transport Canada
Budget:	$370,000

3.4 Safety and Health Issues

The Contractor has read and understood the requirements and responsibilities placed upon the successful bidder as outlined in the RFP and any subsequent addenda and will comply accordingly. WERI will act as the Employer for the remediation project, where WERI will be the only employer on the work site, in accordance with the Authority Having Jurisdiction (AHJ). WERI is currently registered with the Workers Compensation Board (WCB) in the Northwest Territories and Nunavut (Account No. 30884) and is in good standing. An Advance Notification form will be provided to WCB.

Prior to contract award the Contractor shall provide to the Contracting Authority the following documentation:

a) a Workers Compensation safety record (Claims Experience Rating);
b) a Workers Compensation letter of good standing; and
c) a health and safety policy and program, as required by the Occupational Health and Safety Act.

As of May 2004, WERI has successfully completed all testing and safety audits required as part of the COR workplace safety program (Appendix J). The COR safety program is recognized by various federal, provincial and territorial workplace safety departments. It includes the establishing of safety protocols and proper documentation to monitor workplace activities and increase awareness of potential hazards. Fourteen sections comprise the COR safety program, as listed below:

1. Policy and Roles
2. Hazard Assessment
3. Safe Work Practices
4. Safe Work Procedures
5. Rules
6. Personal Protective Equipment
7. Preventative Maintenance
8. Training and Safety Meetings
9. Inspections
10. Accident and Incident Investigations
11. Emergency Preparedness
12. Records and Statistics
13. Waste Management and Environment
14. Health and Safety Committees and Miscellaneous

Prior to commencement of work the Contractor shall provide to the TCPM copies of all necessary permits, notifications and related documents as called for in the scope of work/specifications. The Contractor will also provide to the TCPM a site-specific Health and Safety Plan (HASP).

The HASP, Fire Safety Plan, Airside Security Considerations, Company Safety Policy and Employee Safety Handbook are included in Appendix K.

Contractor Staging Area

The Contractor will make arrangements to make use of a clearly marked trailer as a staging area for the duration of the remediation project. The staging area will be a focal point for all activity pertaining to the remediation project. Airport management will be made aware of the staging area and its function prior to establishing its location airside.

The staging area will be the location of daily meetings during the project. The mobility of the staging area will allow the Contractor to relocate it without difficulty. It will be

equipped with communication equipment (radio and/or satellite telephone), office equipment, emergency (first-aid) facilities, tools and a notebook personal computer.

Safety Officer

The Contractor has appointed a project Safety Officer for the remediation project that will be present on site at all times. The person selected for this role is Mr. Dennis Antony. Mr. Antony has worked on many different construction projects for federal, provincial, civic, municipal and private departments/organizations. Mr. Antony has twenty years of construction safety and emergency training, which he has gained through the following sources and activities:

1. Four years of volunteer ambulance and fire suppression service at Fort Smith, Northwest Territories and Limestone Hydro site.
2. Subsequent formal training and several years of experience in forest fire suppression, emergency response, and missing persons searches. Mr. Antony has been responsible as the Safety Officer of forest fire projects with a budget near $20,000,000.
3. Working knowledge of airports and aircraft from his duties as a Northern Affairs Equipment and Training Officer. Mr. Antony was responsible for air traffic control at airports and forest fire sites for as many as ten aircraft at any given time. Duties included the building of aircraft staging bases, managing air tanker bases, monitoring pilot fatigue, scheduling aircraft and budget administration.
4. Successful completion of the Manitoba Provincial Emergency Preparedness Disaster Management Media Relations course.
5. Participation in several emergency, fire safety, missing persons, disaster scene management, regulatory compliance, first aid, TDG and WHMIS training sessions.
6. Chairman of the Health and Safety Building in Fort Smith, Northwest Territories for two years.
7. Over fifteen years of experience in the construction and public safety fields gained in the course of duties as a Conservation Resource Manager and River Patrol Officer.

The Safety Officer assigned to this project will be responsible for the following:

- Conducting daily safety meetings with all parties concerned.
- Liaison with the TCPM and airport manager to ensure the Safety Plan continues to meet airport requirements.
- First aid.
- Safety training for staff as required.
- Fire Marshall duties.
- Emergency response duties.
- Confirming that all concerned parties have a copy of and understand the Safety Plan. The Safety Officer will utilize a checklist to ensure that all relevant parties possess a copy of the Safety Plan. A copy of the Safety Plan will be posted throughout the project at the staging area.

- Conducting a mock safety drill to implement any health, environmental or safety issues that could occur on site.
- Conducting a pre-start safety audit to identify particular concerns and adjusting the Safety Plan, if required.
- Ensuring that proper personnel protection is available and worn at all times. The Safety Officer will also ensure that all WHMIS, TDG and occupational health and safety regulations are followed.
- Liaison with the airport traffic control officer to ensure that all equipment is operated safely as per airport regulations.
- Ensure principles of the COR safety program are maintained.

Airside Safety Procedures

The WERI Safety Officer has an Air Radio License issued from Department of Industry Canada. The Contractor is willing to commit other staff members for proper instruction in the use of a radio while working airside if TC or the airport manager requires. The Contractor is also committed to assign several staff members to undergo formal instruction in the operation of vehicles airside.

The following list highlights methods the Contractor will implement while airside to promote safety during the remediation project:

- A pilot vehicle will be equipped with a yellow beacon. The operator of the pilot vehicle will have an Airside Vehicle Operator' s Permit (AVOP), if required. The Contractor has previously acquired AVOPs at other airports.
- The pilot vehicle will also be able to communicate with other on site equipment used during the remediation project. Each equipment operator will be supplied with a radio to facilitate communication.
- If required, the airport manager will be contacted for a voice advisory to notify aircraft in the area that work outside normal airport operations is underway airside.
- In the event that height or minimum set-back requirements are violated while working airside, a NOTAM will be requested from the airport manager and Nav Canada. The NOTAM will remain in effect as long as Nav Canada deems necessary.
- Every effort will be made from the Contractor to avoid disruptions during peak flight hours.

Vehicular Traffic Control

1. The Contractor will provide, erect and maintain adequate control devices.
2. Traffic control devices/signs will meet TC standards.
3. All non-portable signs will be posted at right angles to the roadway at not less than 2 m or more than 4 m from the nearest traffic lane.
4. All sign placements will be approved by TC and airport manager.
5. All construction signs and barricades shall be fully reflective.

6. Signs will be checked daily for legibility, suitability, damage and location.
7. Construction markers will indicate hazardous drop-offs, windrows or holes that would impede traffic flow.
8. Speed limits will be posted near work site as required.
9. Signs will be removed or covered as required.

Worker Safety and Site Specific Considerations

The Contractor has worked in several remote locations throughout western Canada and the territories and understands that the topography, geography and environmental conditions in these regions can be challenging to its workers and work activity. The Contractor understands some of the challenges that could inhibit work activity if mitigating measures are not implemented. The following list addresses some of these issues and the mitigating measures that the Contractor will implement for the safety and comfort of its workers.

- Measures will be taken to have appropriate equipment on site and to store equipment properly.
- All personnel working on site will be equipped with steel-toed work boots and hard hats.
- Mosquitoes and flies are abundant in the region. Personnel will be issued with bug jackets, appropriate head gear and repellent.
- A portable toilet will be available for the workers to prevent disruption to normal airport procedures.
- A chemical eyewash and portable shower will be available in the staging area.
- Personal half face-piece respirators with P-100 organic vapour filters will be available for workers in the event that vapour levels will exceed regulations for exposure limits.
- Hearing protection and safety glasses will be available on site.
- Plenty of water will be available for the workers to prevent dehydration and heat exhaustion.
- Visible safety vests will be worn by all personnel at all times during work activity.
- All personnel will wear appropriate protective gear as required by Workplace Safety & Health.
- Fire extinguishers will be readily available in the event of a fire.
- All safety, emergency, environmental and Material Safety Data Sheets (MSDS) will be located within the staging area.
- The emergency phone numbers for the Iqaluit region, as shown in Table 9, will be posted at the staging area.

Table 9: Emergency Phone Numbers for the Iqaluit Region

Agency	*Phone Number*
Police	867.979.0123
Fire	867.979.4422
Health Centre	867.975.4800

Airport Manager	867.979.5224
Local Conservation Office	867.975.5911
Nav Canada	1-800-876-4693

Security

1. The Contractor will be responsible for obtaining and fulfilling any necessary airport access requirements from the airport manager' s office.
2. The Contractor will obtain security passes from the airport manager for all team and subcontractor personnel, if required.
3. The security passes will be visibly worn by all individuals on site for the duration of the project.
4. Only authorized visitors will be permitted on site. Visitors will be provided with and instructed in the proper procedures for usage of personal protection equipment before entering work areas.
5. Security signs indicating a restricted work area will be erected near the site. Barricades will be erected in the vicinity of all working areas to alert others of work activity. Figure 8 identifies some of the signs that will be used for the remediation project. Construction tape will also be used for additional security, if applicable.
6. All equipment remaining on site will be kept in an area approved by the TCPM and the airport manager. Tools will be stored in a storage container and locked at the end of each work day. Heavy equipment will be parked in a designated area and the keys will be removed from the ignition.

3.5 Subcontractors

The following subcontractors and services have been carefully selected to assist the Contractor in successfully completing the remediation project. This section will outline the services to be provided, brief company profile and contact persons.

ETL Enviro-Test LABORATORIES Manitoba Technology Centre Ltd. MTC

The laboratory selected for this project will be Enviro-Test Laboratories in Winnipeg, a CAEAL and SCC accredited laboratory with locations across western Canada. The head office is located in Edmonton, Alberta.

Enviro-Test is a complete service, inorganic/organic testing laboratory, fully equipped to perform hydrocarbon, trace metals and other major ion tests in soil, water as well as biological and waste testing. The laboratory is staffed by experienced analysts. Testing includes atomic absorption spectophotometry, automated chemistry analyzers, ion chromatography and other specific analyzers.

Contact Person: Linda Neimor, Quality Assurance Manager
Ph (204) 945-0085
Fx (204) 945-0763

ENG-TECH CONSULTING LIMITED
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

ENG-TECH will provide any engineered drawings or plans as required by TC and will conduct Standard Proctor testing. ENG-TECH has worked on Phase I, II, III and IV ESAs in Ontario, Manitoba, Saskatchewan, Alberta, Northwest Territories and Nunavut. The projects range from small residential/commercial sites to $11,000,000.00 commercial property transfers. Some of the Phase I ESAs have lead to Phase II ESAs associated with heavy metals, petroleum hydrocarbons, PCBs, sewage (agricultural/residential) and mercury in both soil and water.

The ENG-TECH laboratory is an accredited soils, concrete and asphalt materials testing laboratory. Soil characterization is routinely conducted in ENG-TECH' s laboratory. ENG-TECH staff is capable of evaluating any site contamination through a thorough characterization of soil, sediment, stratigraphy, hydrologic, surface water, groundwater and relevant environmental components. A partial client list includes: TC, DND, Winnipeg Airport Authority, Northland Petroleum Limited, Wasawa Petroleum Corporation, First Nation communities and private corporations.

Contact Person: Clark Hryhoruk, President
Ph (204) 233-1694
Fx (204) 235-1579

RL Hanson Construction Limited

RL Hanson Construction Limited is an Inuit owned general contracting company that has been operating since 1970. RL Hanson specializes in earth moving, sewer and water, camp building, demolition and site restoration. They have a wide range of heavy equipment including bulldozers, trucks, mobile camps and other equipment. All heavy equipment and general labourers will be provided by RL Hanson.

RL Hanson has worked on several construction projects at Iqaluit Airport and are familiar with airport procedures, such as airside safety, and the expectations of airport management. The owner of RL Hanson, Robert Hanson, has participated actively for the last 20 years as part of the Northern Search and Rescue volunteer program. In addition, he has many years of safety disaster management and emergency response experience, which will be crucial in providing a safer work site during the remediation project.

In addition to work conducted at Iqaluit Airport, RL Hanson has extensive experience in environmental remediation contracting in the greater Iqaluit area. They have provided equipment and personnel who have actively participated in PWGSC, TC, Indian and Northern Affairs Canada (INAC) and Government of Nunavut hazardous waste and environmental remediation projects. Activities during these projects have included:

- hazardous waste removal (fuel and solvents);
- community barrel crushing program;
- airport contaminated soil excavation and LTU construction;
- asbestos and PCB abatement; and
- transportation of dangerous goods.

Contact Person: Robert Hanson, Owner
Ph (867) 979-6004
Fx (867) 979-4873

Local Support Services

Table 10 indicates the local businesses the Contractor will use for accommodations and logistical support.

Table 10: Local Support Services

Service	*Company Name*	*Contact Information*
Logistical Support and Accommodations	Frobisher Inn	Ph: (877) 422-9422 Fx: (867) 979-0427

3.6 Heavy Equipment and Specialized Environmental Equipment

Table 11 identifies the best equipment available for the successful completion of the remedial work at Iqaluit Airport. The equipment list for the remediation project has been carefully selected to ensure that the project is completed on time and efficiently.

Too many sections. Should be very different as follows.

Table 11: Equipment List

Units	*Equipment*	*Use*
1	Excavator—Komatsu 200	Excavating test pits
2	Bulldozers—D6 and D8 Cat	Site restoration
3	Tandems	Earth hauling
1	Rubber tracked skid steer—Bobcat T200	Spreading protective fill in LTU
2	Packers—Wheel and Drum Packer	Compaction
1	'90 Champion 730/A Grader	Fine-grading for drainage
1	Portable headspace vapour monitoring device—Dräger Multi-Warn II	Field screening of PHC vapours, O_2, H_2S, CO and NH_4
1	PetroFlag® analyzer	Field screening of PHC vapours
1	Soil and Water Sampling Kit	Sampling
1	GPS and other field surveying equipment	Field surveying
1	TraceMaster™ line locator	Locating utility lines
2	Water Trucks—'80 Ford; '75 Kenworth	Dust control
1	Oil/Water Air Sparging Separator with portable water pump	Treatment of contaminated water

3.7 Final Decontamination

The Contractor will perform final decontamination of construction facilities, equipment and materials, which may have come in contact with potentially contaminated materials prior to removal from site. Decontamination will be performed as specified to the satisfaction of the TCPM. The TCPM will instruct the Contractor to perform additional decontamination, if required.

3.8 Procurement Business Number

WERI has a Procurement Business number as required for PWGSC contracts. WERI' s Business Procurement number is 888945458PG0001.

3.9 Contact Person Information

All written or telephone correspondence regarding the project can be directed to:

Dennis Antony, Environmental Scientist
WERI
805 Blackdale Road
West St. Paul, Manitoba
R4A 9A4
Ph: (204) 339-5193
Fx: (204) 334-6933
Email: macnut@mts.net

3.10 Confidentiality

All information, data, material, *etc* gathered as part of this project shall be treated as confidential, the property of TC and shall only be discussed with the TCPM and TC personnel unless otherwise directed and authorised.