

COMPLETION REPORT

for

**Maintenance of Interim Soil Cover for
Upper Trinity South (New Harbour) Waste Disposal
Site
New Harbour, NL**

Submitted to:

Department of Environment and Conservation
4th Floor West Block, Confederation Building
P.O. Box 8700
St. John's, NL A1B 4J6

Submitted by:

**AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited**
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May 2013

AMEC Project No. TF1212734



May 14th, 2013

TF1212734

Jennifer Strickland, P. Eng.
Government of Newfoundland and Labrador
Department of Environment and Conservation
4th Floor West Block, Confederation Building
P.O. Box 8700
St. John's, NL, A1B 4J6

Dear Ms. Strickland,

Re: Maintenance of Interim Soil Cover for Upper Trinity South (New Harbour) Waste Disposal Site

AMEC has completed supervision of maintenance of interim soil cover of the closure plan for the Upper Trinity South Waste Disposal Site located in New Harbour, NL. The following report provides a summary of activities and as-built conditions as of March 2013.

Sincerely,

Stephen Cutcliffe, B. Eng
Junior Project Manager
Direct Tel.: (709) 722-7023
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1.0 INTRODUCTION

AMEC Environment & Infrastructure, a Division of AMEC Americas Limited (AMEC), was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) for the implementation of maintenance of interim soil cover for the Upper Trinity South (New Harbour) Waste Disposal Site, located east of the community of New Harbour, Newfoundland and Labrador (NL), herein referred to as "the Site". This work was completed as part of the second phase of a 3-year closure plan for the Site, as outlined in the report titled *"Closure Plan, Upper Trinity South (New Harbour) Waste Disposal Site, March 2011"*, and included the placement, grading, and compaction of imported soil to the Site (to prevent surface ponding) and perimeter ditching. The scope of work included the following tasks:

1. Tender Preparation and Issue;
2. Contract Management;
3. Construction Management; and
4. As-built Drawings and Reporting.

This report provides an overview of the activities undertaken to complete the above scope of work.

2.0 BACKGROUND INFORMATION

The Site is located south of Route 73 on the New Harbour Barrens and has operated as a domestic waste disposal facility since the early 1970s. As of November 2009, the facility ceased operations. In the past the facility accepted domestic waste from the communities of Blaketown, Dildo, Green's Harbour, Hopeall, Markland, New Harbour, Old Shop, South Dildo, Bay Roberts and Cupids.

The facility is unlined; however, potential impacts from leachate generated at the Site are now being managed by an interception ditch and leachate collection pond constructed at the Site in 2007. Until recent years, open burning was a common practice carried out at the Site to reduce waste volumes and control vermin. The surrounding area consists of vacant, undeveloped land that is comprised mostly of bogs/wetland and forested areas with several ponds and streams located up-gradient and down-gradient of the facility.

During the period of 1992 through 1995, the ENVC undertook a polychlorinated biphenyl (PCB) remediation program at a nearby scrap yard, located in the community of Makinsons, NL. During this program, low-level PCB-impacted scrap metal and transformer casings were transported to Upper Trinity South Waste Disposal Site and buried on-Site, within the landfill waste. Previous soil sampling programs carried out by AMEC and SGE Acres Limited revealed levels of PCBs in soil at the Site that exceeded the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guideline (CSQG) of 33 mg/kg for PCBs in soil at commercial sites.

In June 2006, AMEC submitted a design for a leachate control system to the ENVC. Aspects of the design were chosen based on their ability to be constructed while the landfill continued to operate, and the level of environmental protection considered necessary at that time. Specific measures implemented at the Site to control leachate included a leachate collection pond in a low lying area to the south of the waste disposal site and three drainage ditches to intercept surface water before it could enter the waste site and direct it to natural collection areas away from the waste.

In 2008, AMEC prepared an invitation to tender (ITT) for a PCB remediation program at the Site. The PCB remediation program was carried out at the Site in two phases (Phase I and Phase II). Phase I was carried out on September 9 and 10, 2008 and involved the removal of 43.57 tonnes of PCB impacted material from two locations (Location A and Location B). Phase II of the remediation program was carried out on October 25, 2009 and involved the removal of an additional 76.78 tonnes of PCB impacted material from Location A. In total 120.5 tonnes of PCB impacted material were removed from locations A and B by Edward Collins Contracting Limited and transported to the Universal Environmental Services Inc. (UESI) soil treatment facility located in Sunnyside, NL. Confirmatory soil samples collected from location A contained PCB concentrations above the CCME-CSQG of 33 mg/kg. PCB concentrations for overburden samples collected adjacent to Location A were below the CCME-CSQG of 33 mg/kg.

At the request of ENVC, Location A was partially backfilled with PCB-impacted material including materials that was initially excavated and stockpiled from Location A during the Phase I remediation program. The excavation was lined with 6 mil polyethylene sheeting to mark the boundary of the excavation extents, for future excavation and removal of the material. The PCB impacted material was placed on top of the polyethylene sheeting then covered by a layer of polyethylene sheeting and oriented strand boards (OSBs). Surrounding overburden was then placed on top of the polyethylene sheeting and OSBs and the excavation was backfilled to match the surrounding grade.

In January 2009, AMEC conducted a supplementary PCB soil sampling program at the Site. The program included the excavation of five trenches (Trench 1 to Trench 5) adjacent to Location A and the collection of representative soil samples from each of the trenches. A total of 44 soil samples were submitted to an accredited laboratory for PCB analysis. Soil samples collected from trenches located southeast and south of the former remediation Location A (Trench 2 and Trench 3) contained PCB concentrations that exceeded the CCME-CSQG of 33 mg/kg. Numerous transformer casings and scrap metal were also observed in some of the trenches.

In 2009, Clifford Cooper Construction, under the supervision of SNC, completed the work required at the Site in order to restrict access to the facility. The physical work included installing concrete barriers, improving the existing fencing and erecting the proper closure signage.

In 2010 AMEC supervised the removal of additional PCB impacted material from Location A of the site. The contract for the removal of the material was awarded to Sanexen Environmental

Services Inc. (Sanexen), the material was excavated by Professional Grading and Contracting Ltd., transported off Site by Laidlaw Carriers Bulk Group Inc., and was treated by Horizon Environment Inc. located in Quebec. Approximately 136 tonnes of material was excavated and removed from the Site and the excavation was backfilled with clean (i.e., tested) imported fill material. Further information on the removal of PCB impacted material in 2010 is provided in the report titled *"Removal of PCB-Impacted Material, Upper Trinity South Waste Disposal Facility, New Harbour, NL, January 2011"*.

In 2011, AMEC completed inspections of the leachate control system at the Site and the geomembrane being stored at the ENVC fenced storage yard in Conception Bay South, NL. At that time, the leachate control system was observed to be in good condition with no blockages or eroded areas noted. The polyethylene tarps covering the rolls of geomembrane appeared in good condition and, no tears or areas of exposure were noted on the geomembrane during the inspection. The geomembrane manufacturer, Solmax International, was contacted to confirm the integrity of the geomembrane and storage conditions. Confirmation was made that degradation of the geomembrane would not be cause for concern. Although not required by the manufacturer, a single outer layer of the geomembrane may be removed prior to use should exposure be noted. Further is provided in the report titled *"2010-2011 Annual Report of Activities, Upper Trinity South (New Harbour) Waste Disposal Site, March 2011"*.

In 2011, AMEC completed the first phase (Year 1) of the Three Phase (3-year) closure plan for the site. AMEC was responsible for the preparation of construction drawings and tender document, construction management and supervision of construction activities, and final as-built drawing and reporting for the Project. Construction activities for Phase 1 included: Litter collection and control, consolidation, grading and compaction of existing waste, interim soil cover, tire collection and recycling, Metal consolidation and recycling, and installation of site signage and placement of barriers to block site access.

3.0 PROJECT OBJECTIVES

Work on this project involved a number of tasks, which included:

3.1 TENDER PREPARATION AND ISSUE

AMEC was responsible for the preparation of construction drawings and tender documents for the project for the maintenance of interim soil cover for the Upper Trinity South Waste Disposal Site, as part of the second phase (Year 2) of a Three Phase (3-year) closure plan for the Site. The tender was prepared using the Department of Municipal Affairs (MA) Capital Works Tender Specifications.

AMEC provided ENVC with the tender documents for final review and issue for public tender. The Tender was issued on November 24th, 2012 and closed December 17th, 2012. No addendums were issued.

Three bidders submitted completed tender forms for the work. Bidders that submitted tender forms were:

- Riverside Excavating Ltd.
- M. J. Hickey Construction Ltd.
- Concord Paving Ltd.

Following a complete review of the tender forms and associated documents, the project was awarded to the low bidder Riverside Excavating Limited (Riverside). After failing to submit their Newfoundland and Labrador Construction Safety Association Core Certification within the allotted 14 day time period Riverside were disqualified from the Project 24 days after award notification. The project was then awarded to the second low bidder M. J. Hickey Construction Ltd (Hickey). No sub-contractors were used to complete the work.

AMEC was subsequently responsible for coordinating work with the contractor and supervision during construction. Contractor quantities were reviewed by AMEC and presented to ENVC for payment.

3.2 CONTRACT MANAGEMENT

3.2.1 Health and Safety

AMEC was responsible for preparing a site specific Health and Safety Plan for work carried out by AMEC.

Health and safety tailgate meetings were conducted daily by the contractor throughout the project. AMEC reviewed the meeting minutes and provided comments to the superintendent where required.

No health and safety incidents were reported during the project.

3.2.2 Surveying

Initial and final surveying was conducted by AMEC personnel for the purpose of determining the cover quantities for the project.

A grid was surveyed after final placement and compaction of the maintenance cover noting the northing, easting, and elevation of multiple as-built points. This grid will be tracked via GPS and the elevations will be recorded during any follow up inspection.

3.2.3 Daily Progress Meetings

Informal progress meetings were held on a daily basis to discuss progress to date, scheduling, future planned activities, and any health and safety concerns.

3.2.4 Environmental Compliance

No environmental permits were required for the project and no issues were identified during construction.

3.3 CONSTRUCTION MANAGEMENT

3.3.1 Imported Soil Cover

It was estimated that several portions of the site required cover material; a total of 14,000 m³ of material were estimated for the project. Cover material was imported to the site by M J Hickey from a local pit located on Route 73 approximately 1.4 km from the site. As per tender specifications this material generally consisted of imported till, free of particles greater than 150 mm. To prevent sharp rock particles near the surface, no particles greater than 100 mm were placed in the top 100 mm of fill on the surface.

Phase II included fill placement as shown on Drawing 4, including: the slope, the buried waste area, the sawdust area, the former metals and boulder area, and the access road.

Prior to placing cover on the slopes, the contractor had to snow clear the slopes. From AMEC's initial inspection the slope remained in good condition from Phase I activities, with minimal evidence of erosion, disturbance, and settlement. Phase II included additional grading and approximately 2500 m³ fill placement on the slope to further increase the stability.

The buried waste area, required additional fill over the surface. The additional fill was placed and graded to create a crown through the center of the site. The crown was graded at 3.28% on both sides to prevent surface ponding in this section. A total of 8500 m³ of fill was placed and compacted over the buried waste area.

The sawdust section required some cover material. Approximately 1000 m³ of fill was used in this area to cover the section. The metals, boulder, and access sections required approximately 2000 m³ of fill. The Phase II site inspection identified areas of minimal surface litter and sink holes. Imported fill was placed and compacted over these areas.

Imported cover material was transported to the site and required areas using tandem dump trucks, where it was placed, graded and compacted using dozers and excavators. The PCB impacted area was not included in this scope of work.

Photographs of the site during each phase of construction are presented in Appendix B.

3.3.2 Inspection and Testing

Craig Taylor, CET, of AMEC, supervised construction activities between March 11th, 2013 and March 31st, 2013 to ensure that placement, grading and compaction of imported cover material was completed as per tender specifications.

3.3.3 Quantity Control

The grading, compaction and covering of the site was completed as per the tendered documents. The table below summarizes these quantities.

Description	Unit	Tender Quantity	Actual Quantity	Deviation
Mobilization & Demobilization	L.S.	1	1	0
Type 'D' Project Sign Installation	L.S.	1	1	0
Removal/Replacement of concrete barriers	L.S.	1	1	0
Clearing - Labour	hrs	40	40	0
Grading - Excavator	hrs	60	60	0
Supply & Install Type 1 Material	m ³	14000	14000	0

3.4 AS-BUILT DRAWINGS AND REPORTING

A final survey was conducted by AMEC upon completion of all site works. This data was used to produce as-built drawings of the site, identifying final grades. This information will be used, along with supplemental survey data in following years, to determine the amount of settlement, if any, over the area of the site.

Daily reports were kept in a field book to track and document daily progress. The AMEC project manager was updated on the project progress on a regular basis. The AMEC Project Manager was responsible for communicating the project status to the ENVC project manager on a regular basis.

4.0 FUTURE WORK

Work completed in 2013 was a part of Year Two of a 3-year plan for the closure of the Former Upper Trinity South Waste Disposal Site.

Year Three of the closure plan will include a Human Health and Ecological Risk Assessment (HHERA), which will assess the potential for adverse health effects to both human health and the environment due to exposure to chemicals of potential concern (i.e. PCBs) in various environmental media (i.e. soil, groundwater, sediment and surface water) identified at the site. Inspections and monitoring of the site and any maintenance that may be required on the collection pond, perimeter ditching, interim cover, or access road will also be completed as part of Year Three work. In the event that the HHERA reveals potential for risks to the health of human and/or ecological receptors present at the site, a Remedial Action Plan / Risk Management Plan (RAP/RMP) will be developed to remediate or risk manage any areas of concern.

5.0 CLOSURE

This completion report was prepared for the exclusive use of the Newfoundland and Labrador Department of Environment and Conservation for specific application to the project site and was conducted in accordance with the work plan developed for this site and verbal requests from the client. The work was performed using generally accepted engineering practices and procedures commonly used in the industry.

Respectfully Submitted,

**AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited**

A handwritten signature in black ink, appearing to read "S. Cutcliffe", written over a faint circular stamp.

Stephen Cutcliffe, B. Eng

Reviewed by:

A handwritten signature in black ink, appearing to read "Clifford Smith", written over a faint circular stamp.

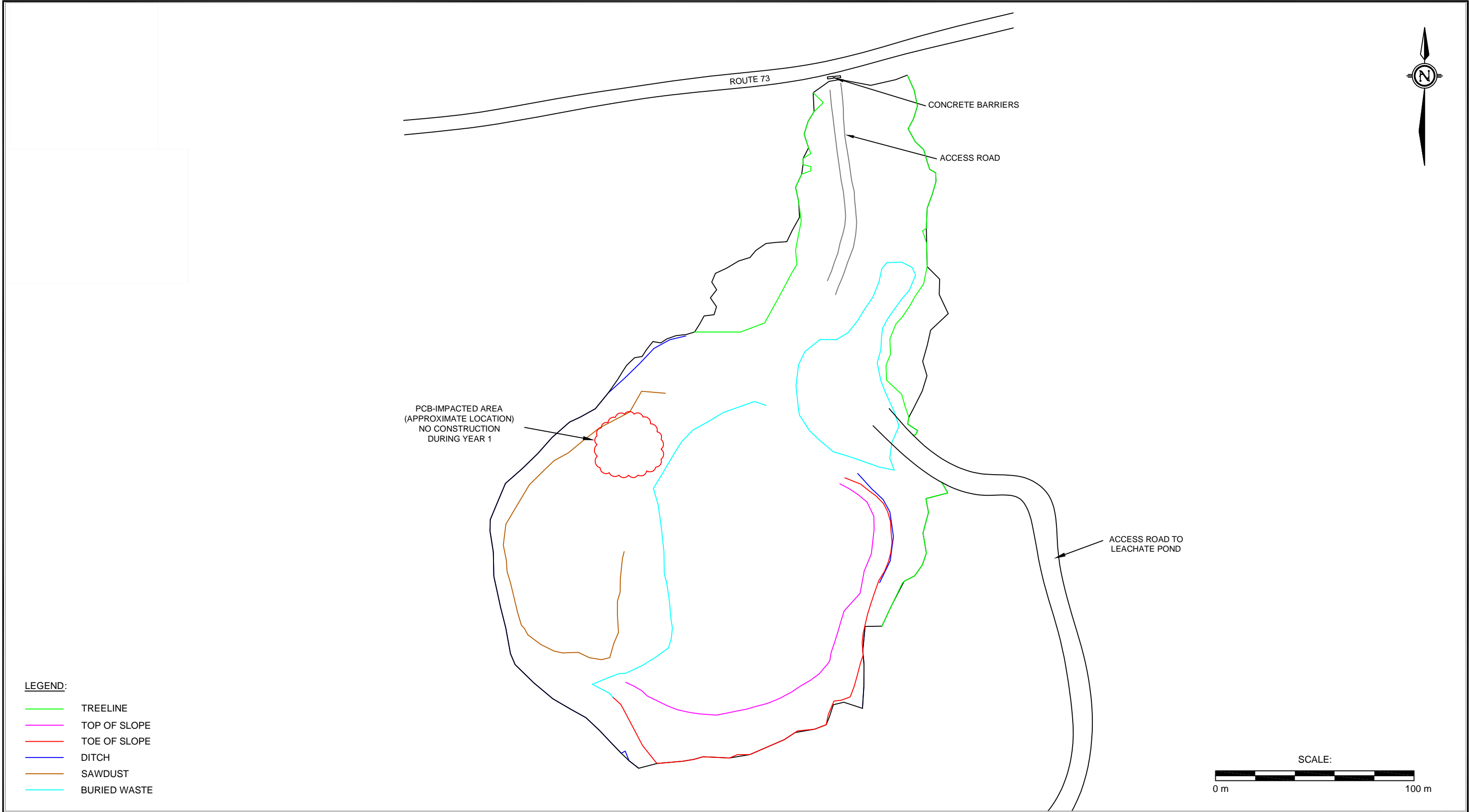
Clifford Smith, P. Eng.

APPENDIX A

DRAWINGS

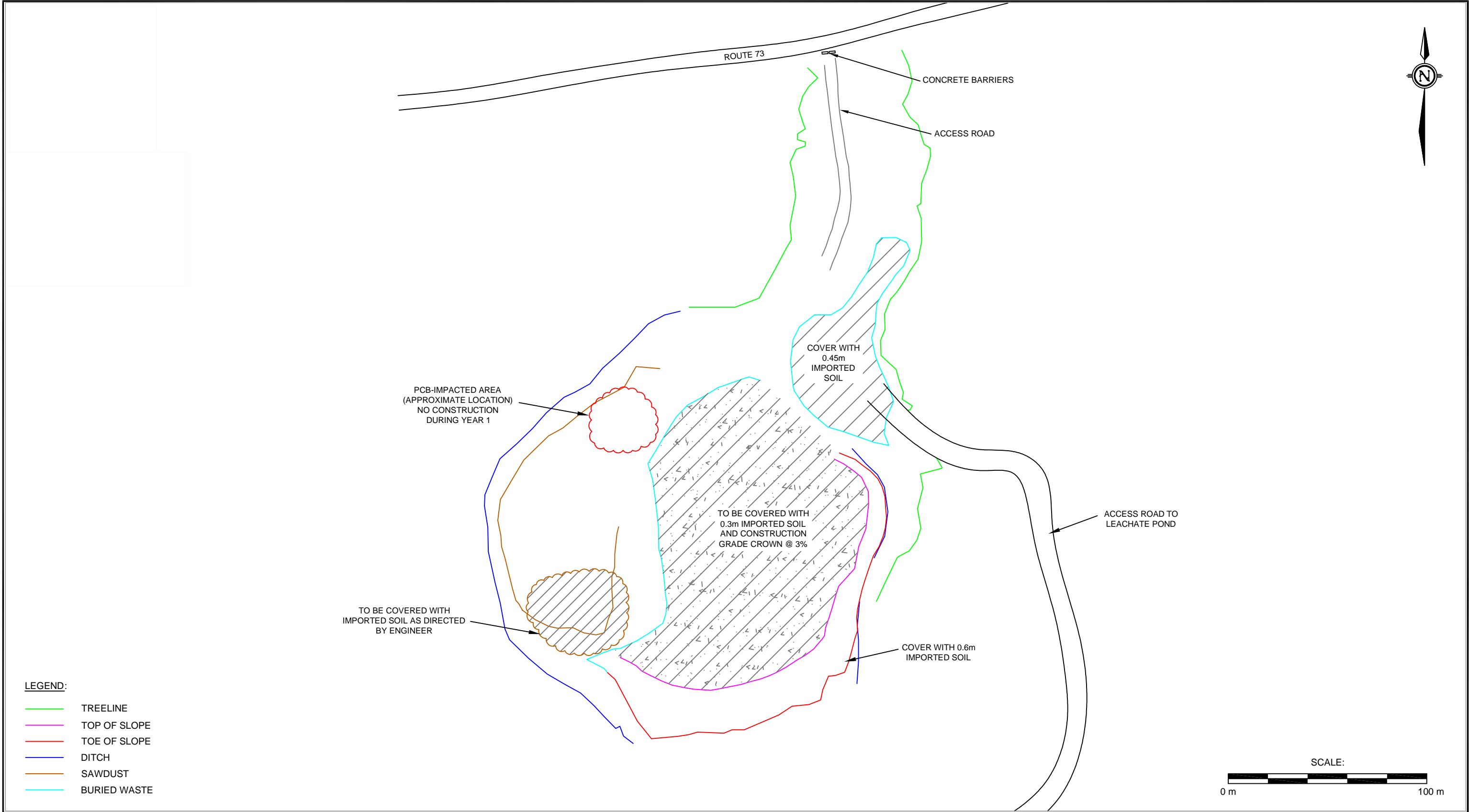


NOTE: 1. ALL DIMENSIONS ARE IN METERS. 2. DO NOT SCALE FROM DRAWING. 3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT. 4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE. 5. THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE. 6. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.	CLIENT:  Government of Newfoundland and Labrador Department of Environment Conservation		DWN BY: H. Ryan	PROJECT MAINTENANCE OF INTERIM SOIL COVER FOR UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE	DATE November 2012
	AMEC Environment & Infrastructure 133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023		CHK'D BY: C. Smith		PROJECT No. TF1212734
			SCALE: NTS	TITLE SITE LOCATION PLAN (AERIAL PHOTO)	REV. No. 0
					DRAWING No. 1

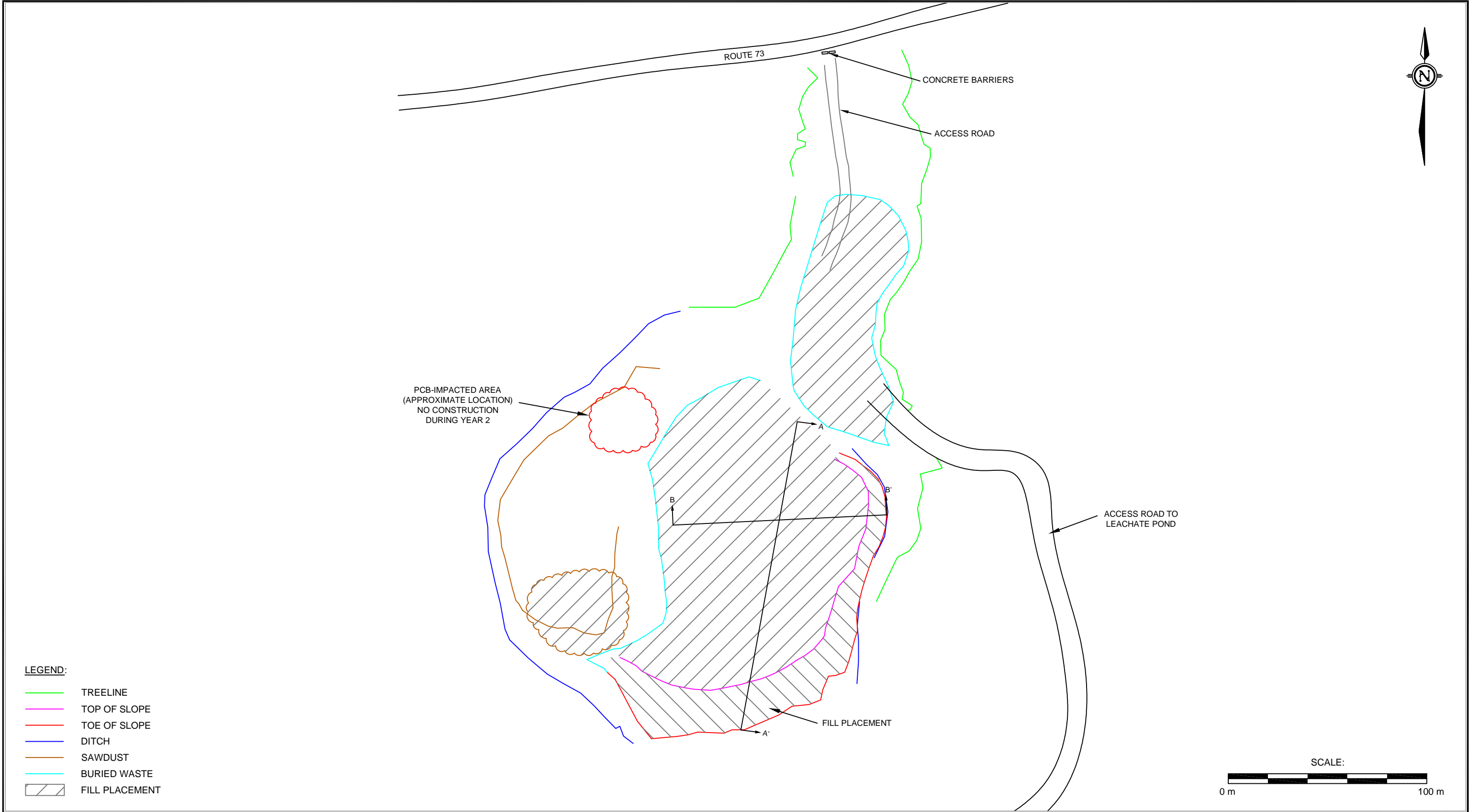


- LEGEND:
- TREELINE
 - TOP OF SLOPE
 - TOE OF SLOPE
 - DITCH
 - SAWDUST
 - BURIED WASTE

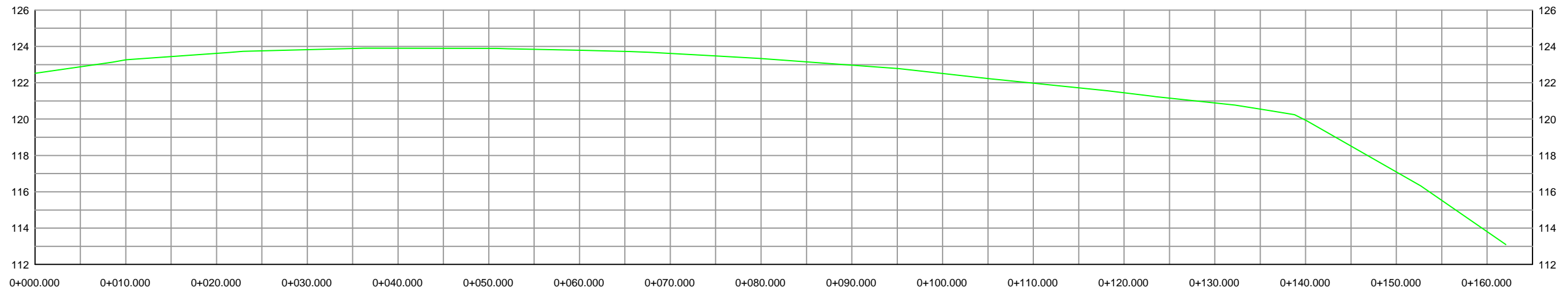
NOTE: 1. ALL DIMENSIONS ARE IN METRES. 2. DO NOT SCALE FROM DRAWING. 3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE WORK AREA. 4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE. 5. THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE. 6. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF THE GOVERNMENT OF NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.	CLIENT:		DWN BY:	PROJECT:	DATE:
	 Government of Newfoundland and Labrador		H. Ryan	MAINTENANCE OF INTERIM SOIL COVER FOR UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE	November 2012
	Department of Environment and Conservation		CHK'D BY:		PROJECT No. TF1212734
	AMEC Environment & Infrastructure 133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023		C. Smith	TITLE:	REV. No. 0
			SCALE:	EXISTING SITE PLAN	DRAWING No. 2
			As Shown		



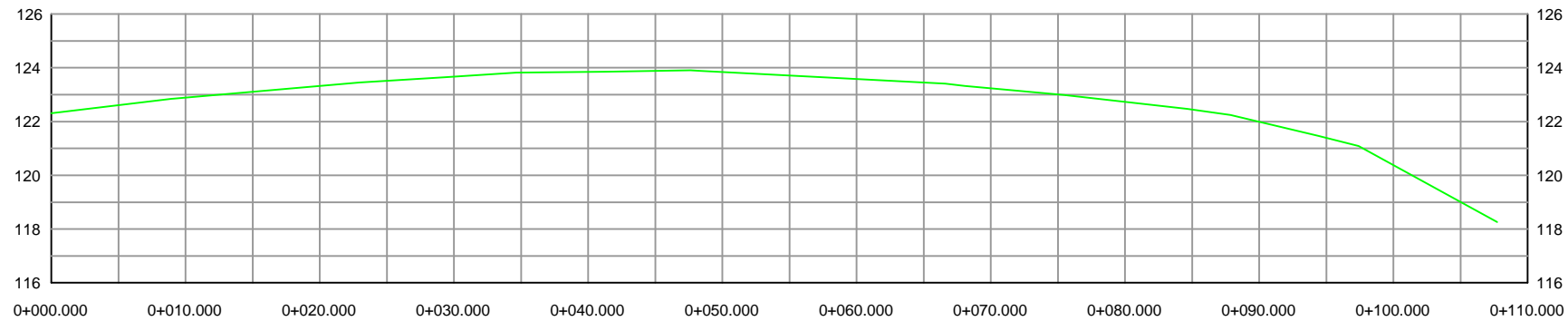
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	 Government of Newfoundland and Labrador		H. Ryan	MAINTENANCE OF INTERIM SOIL COVER FOR UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE	November 2012
	Department of Environment and Conservation		CHK'D BY:		PROJECT No. TF1212734
	AMEC Environment & Infrastructure 133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023		C. Smith	TITLE:	REV. No. 0
			SCALE:	PROPOSED SITE PLAN	DRAWING No. 3
			As Shown		



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	 Government of Newfoundland and Labrador		H. Ryan	MAINTENANCE OF INTERIM SOIL COVER FOR UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE	May 2013
	Department of Environment and Conservation		CHK'D BY:		PROJECT No. TF1212734
	AMEC Environment & Infrastructure 133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023		C. Smith	TITLE:	REV. No. 0
			SCALE: As Shown	FINAL SITE PLAN	DRAWING No. 4



SECTION A-A'



SECTION B-B'

LEGEND:
— EXISTING GROUND

NOTE:
1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
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CLIENT:



Government of Newfoundland and Labrador

Department of Environment and Conservation

AMEC Environment & Infrastructure

133 Crosbie Road
St. John's, NL
A1B 4A5
709-722-7023



DWN BY:
H. Ryan

CHK'D BY:
C. Smith

SCALE:
As Shown

PROJECT:
MAINTENANCE OF INTERIM SOIL COVER
FOR UPPER TRINITY SOUTH (NEW HARBOUR)
WASTE DISPOSAL SITE

TITLE:
FINAL GRADE

DATE:
May 2013

PROJECT No.
TF1212734

REV. No.
0

DRAWING No.
5

APPENDIX B

SITE PHOTOS



Photo 1 – Boulder section prior to fill placement.



Photo 2 – Site access road and metals section during construction.



Photo 3 – Buried waste section from Phase I prior to fill placement.



Photo 4 – South slope prior to grading and fill placement.



Photo 5 – West side of access road looking north prior to construction.



Photo 6 – Boulder section during fill placement.



Photo 7 – Compaction of fill material on south slope looking east.



Photo 8 – South slope looking west



Photo 9 – East slope and ditch looking north.



Photo 10 – Ditching between sawdust and buried waste sections.



Photo 11 – Buried waste section looking north.



Photo 12 – Southeast corner slope looking south.



Photo 13 – Buried waste section looking southwest.



Photo 14 – Buried waste section looking west.



Photo 15 – Buried waste section looking southwest.



Photo 16 – Buried waste section during construction looking south.



Photo 17 – Sawdust section during construction, final grade on buried waste section looking northeast.



Photo 18 – Final grade on buried waste section looking east.



Photo 19 – Final grade on buried waste section looking south.



Photo 20 – Final cover on site access section looking north.