



COMPLETION REPORT

for

Grading, Compaction, and Interim Cover of Former Upper Trinity South 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**
133 Crosbie Road
PO Box 13216
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March 2012

AMEC Project No. TF1112732



March 19th, 2012

TF1112732

Christa Curnew, 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. Curnew,

Re: Grading, Compaction, and Interim Cover of the Former Upper Trinity South Waste Disposal Site

AMEC has completed supervision of Year One of the closure plan for the Former 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 December 2011.

Sincerely,

A handwritten signature in black ink, appearing to read "Clifford G. Smith".

Clifford G. Smith, P. Eng.
Project Manager
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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 grading, compaction, and interim cover of the Former 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 the first 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 consolidation and compaction of all waste materials, grading of the Site (to facilitate runoff away from the waste), the supply of interim cover (to reduce the infiltration of precipitation through the waste), and the removal of recyclable metals disposed of at the Site. 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 is no longer operational. In the past the facility has 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 dumpsite 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*".

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 grading, compaction, and interim cover of the Former Upper Trinity South Waste Disposal Site, the first phase (Year 1) 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 September 14th, 2011 and closed September 30th, 2011. No addendums were issued.

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

- M. J. Hickey Construction Ltd.
- Clifford Cooper Construction Ltd.
- Edward Collins Contracting Ltd.
- Clarke's Trucking and Excavating Ltd.
- H & B Construction Ltd.

- Harbour Construction Ltd.
- Concord Paving Ltd.
- Pennecon Heavy Civil Ltd.
- Point Contracting Inc.
- Hickey's Contracting 1989 Ltd.
- Professional Grading and Contracting Ltd.

Following a complete review of the tender forms and associated documents, the project was awarded to 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 full time 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.

One health and safety incident was reported during the project. On November 23rd, 2011, a worker pinched his finger in the tailgate of a tandem dump truck. He received emergency first aid on site and was transported to a medical facility for further treatment. The worker did not sustain any broken bones or nerve damage, and received the appropriate medical attention to repair the injury.

3.2.2 Surveying

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

A grid was surveyed after final placement and compaction of the interim 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 each 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 Litter Collection

Collection and disposal of windblown litter and debris was performed throughout the project, typically by labourers hand picking. However, in areas of high debris concentration an excavator and tandem dump truck were used. All collected litter and debris was disposed of with the other waste on the site. Generally, all litter within a 50m buffer of the site was collected, compacted and covered.

3.3.2 Consolidation, Grading, and Compaction of Existing Waste

The existing waste was scattered throughout the site with the majority of the waste located in four stockpiles (east, west, northeast, and sawdust). The east and west stockpiles were disposed of in the excavation for the main source of borrow. This borrow was located within a roadway that was located between the east and west stockpiles. Sections of the east and west stockpiles had to be relocated to allow for a sufficient footprint for the borrow prior to its excavation. Once the borrow was excavated the waste in the east and west piles were placed in this excavation, graded, compacted, and covered with soil. A small amount of exposed waste from the sawdust stockpile was also transported to the excavation for disposal. The excavators were used to place the waste into the excavation while the dozer was used to spread and compact the waste in lifts of approximately 1 m thick. Due to the volume of the waste exceeding the volume of the excavation, the finished grade was approximately 1 to 2 m higher than the original grade. This additional grade assisted with providing positive drainage away from the waste and allows for any potential future settlement. The amount of settlement may vary throughout the excavation, but should be minimal due to the majority of the waste being decomposed (minimal organics) and most of the air voids filled with soil and other matter.

The waste stockpile in the northeast of the site was loaded into tandem trucks and transported to the southeast corner of the site, placed on the slopes, graded and compacted with the dozer and sloped at an average grade of 3:1.

The PCB impacted area was not included in this scope of work.

The estimated volume of waste relocated and consolidated was 16,800m³.

3.3.3 Interim Soil Cover

All exposed waste on the site required interim cover with a minimum thickness of 1.0 m. Where possible, two or more lifts were utilized for placement of this cover. Exceptions to the 1.0m of cover were made for areas where waste was previously covered and no protruding objects were

observed. An area of approximately 24,000 m² required covering. Excavated cover material was loaded into tandem dump trucks and transported to the required areas, where it was spread using dozers and excavators. The PCB impacted area was not included in this scope of work.

A portion of the cover material from the main borrow was temporarily stockpiled in the northeast area of the site while the main borrow was filled with waste. Once the waste was placed and graded in the main borrow area, the stockpiled cover material and the material from the secondary borrow source was loaded into tandem trucks, dumped around the perimeter of the main borrow area, and spread and compacted using the dozer. Material from the secondary borrow source was also placed on the graded and compacted waste along the southeast slopes of the site.

Numerous boulders (some as large as 2 m³) were encountered throughout the borrow areas. These boulders had not been previously identified and were not addressed in the tender. Care was exercised during excavation and placement to ensure that no boulders larger than 0.5 m in diameter were placed within the cover. The oversize boulders were temporarily stockpiled throughout the site and subsequently disposed of in the base of the secondary borrow source, adjacent to the access road, and covered with soil.

3.3.4 Tire Collection & Recycling

All tires on site were originally proposed to be removed from site for recycling. Due to excessive dirt on the tires and a number of tires being affixed to metal rims they were in non compliance with current tire recycling policies and would not be accepted by tire recyclers. The tires were disposed of in the same manner as the waste during consolidation and compaction.

3.3.5 Metal Relocation & Recycling

All accessible metals located within the site, including car wrecks and bulk metal, were collected and consolidated to one area for recycling. Newco Metal & Auto Recycling Limited collected this metal on December 12th, 2011 for transportation to their metal recycling facility in St. John's.

3.3.6 Site Access and Signage

Prior to construction concrete barriers and a chain link fence with a gate impeded the general public from gaining access to the site. Upon complete of the project, the concrete barriers were reinstated and the gate locked.

Signage installed on site during construction included six Type 'A' "No Trespassing" and "No Dumping" signs, and one Type 'D' project sign. The project sign was installed at the site entrance, while the Type 'A' signs were installed in areas visible to the public, such as adjacent ATV trails.

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

3.3.7 Inspection and Testing

Craig Taylor, CET, of AMEC, supervised construction activities between November 7th, 2011 and December 21st, 2011 to ensure that consolidation and compaction of waste and the excavation, placement and compaction of the interim cover was completed as per tender specifications.

3.3.8 Quantity Control

The grading, compaction and interim covering of the waste was completed as per the design brief and the tendered documents. Onsite conditions encountered during construction resulted in a change in the equipment time required to grade and compact the waste. The excavator time increased while the dozer and dump truck time decreased. The table below summarizes these quantities.

Description	Unit	Tender Quantity	Actual Quantity	Deviation
Mobilization & Demobilization	L.S.	1	1	0
Silt Fence Installation	m	150	0	-150
Type 'D' Project Sign Installation	L.S.	1	1	0
Type 'A' Sign Installation	each	6	6	0
Removal/Replacement of concrete barriers	L.S.	1	1	0
Clearing - Excavator	hrs	50	50	0
Clearing - Tandem Dump Truck	hrs	50	50	0
Clearing - Labour	hrs	400	496	96
Grading - Excavator	hrs	450	930	480
Grading - Dozer	hrs	150	98	-52
Grading - Tandem Dump Truck	hrs	400	113	-287
Supply & Install Type 1 Material	m ³	24000	23992	-8
Excavation - Excavator	hrs	50	150	100

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 extents of buried waste, extents of the cover, location of borrow sources, and 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 and to design for the final cover.

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 2011 was Year One of a 3-year plan for the closure of the Former Upper Trinity South Waste Disposal Site.

Year Two 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 Two 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.

Year Three of the closure plan will include further inspections and monitoring of the site, any required maintenance, and the installation of geomembrane and associated infrastructure, grading and compaction of the final cover, and hydroseeding of the entire site to prevent erosion.

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 "Clifford G. Smith".

Clifford G. Smith, P. Eng.

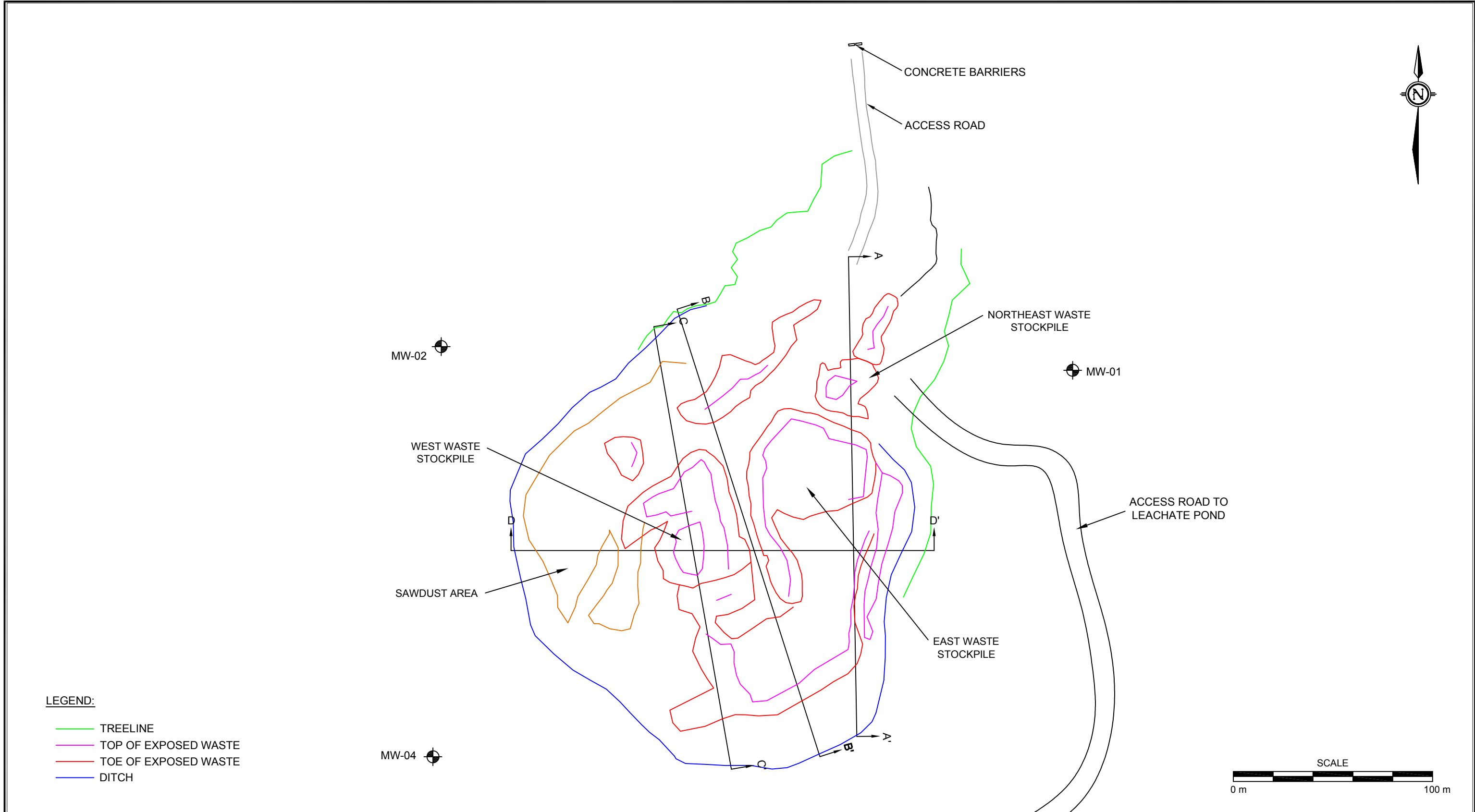
Reviewed by:

A handwritten signature in blue ink, appearing to read "Kevin Penney".

Kevin Penney, MScEng, P. Eng.

APPENDIX A

DRAWINGS



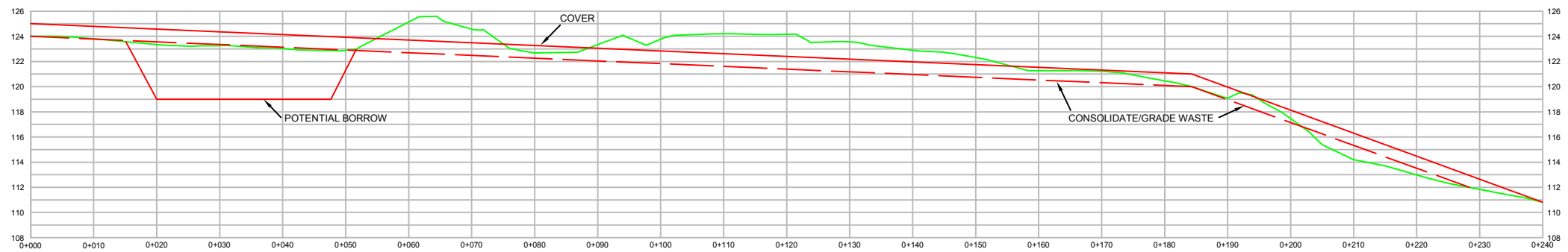
LEGEND:

- TREELINE
- TOP OF EXPOSED WASTE
- TOE OF EXPOSED WASTE
- DITCH

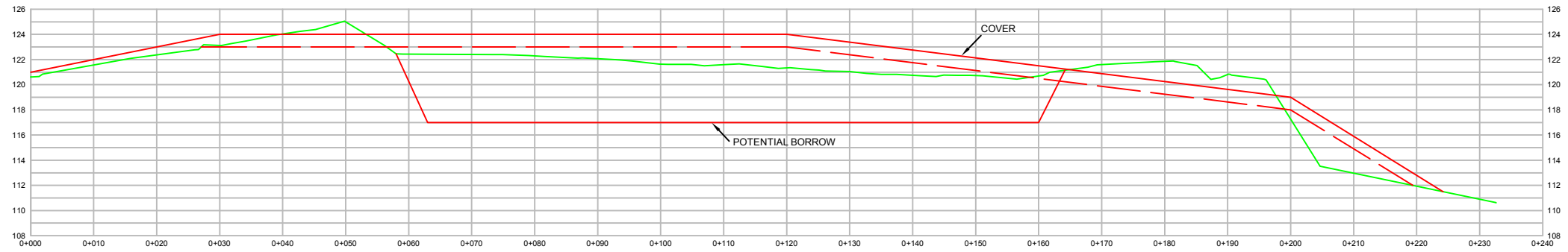
NOTE:

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.

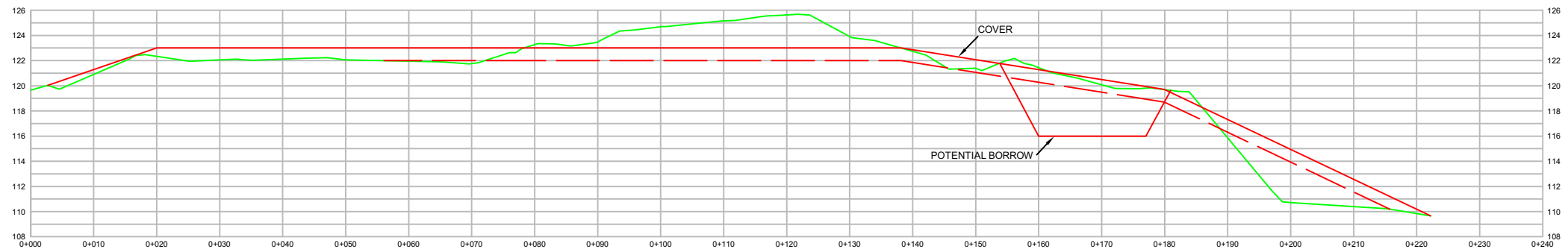
<p>CLIENT:</p> <p>Government of Newfoundland and Labrador</p> <p>Department of Environment and Conservation</p>	<p>DWN BY:</p> <p>A. Hollett</p> <p>CHK'D BY:</p> <p>C. Smith</p> <p>SCALE:</p> <p>As Shown</p>	<p>PROJECT:</p> <p>NEW HARBOUR WASTE DISPOSAL SITE INTERIM COVER</p> <p>TITLE:</p> <p>PRE-CONSTRUCTION EXISTING SITE PLAN</p>	<p>DATE:</p> <p>March 2012</p> <p>PROJECT No.</p> <p>TF1112732</p> <p>REV. No.</p> <p>0</p> <p>DRAWING No.</p> <p>1</p>
<p>AMEC Environment & Infrastructure</p> <p>133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023</p>			



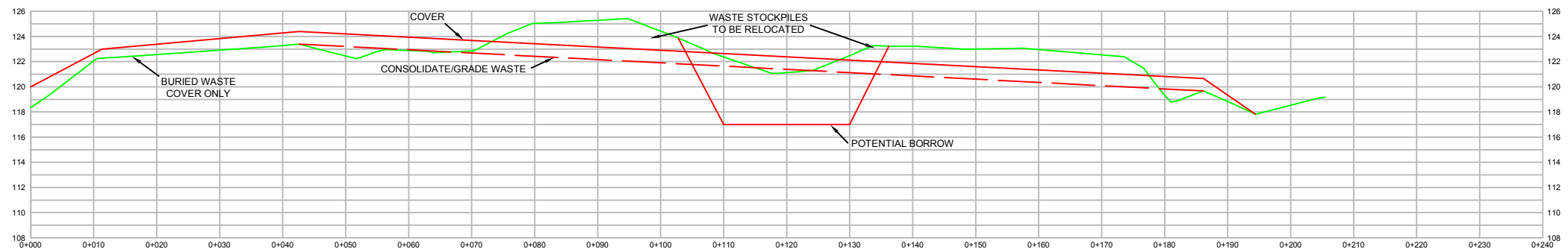
SECTION A-A'



SECTION B-B'



SECTION C-C'





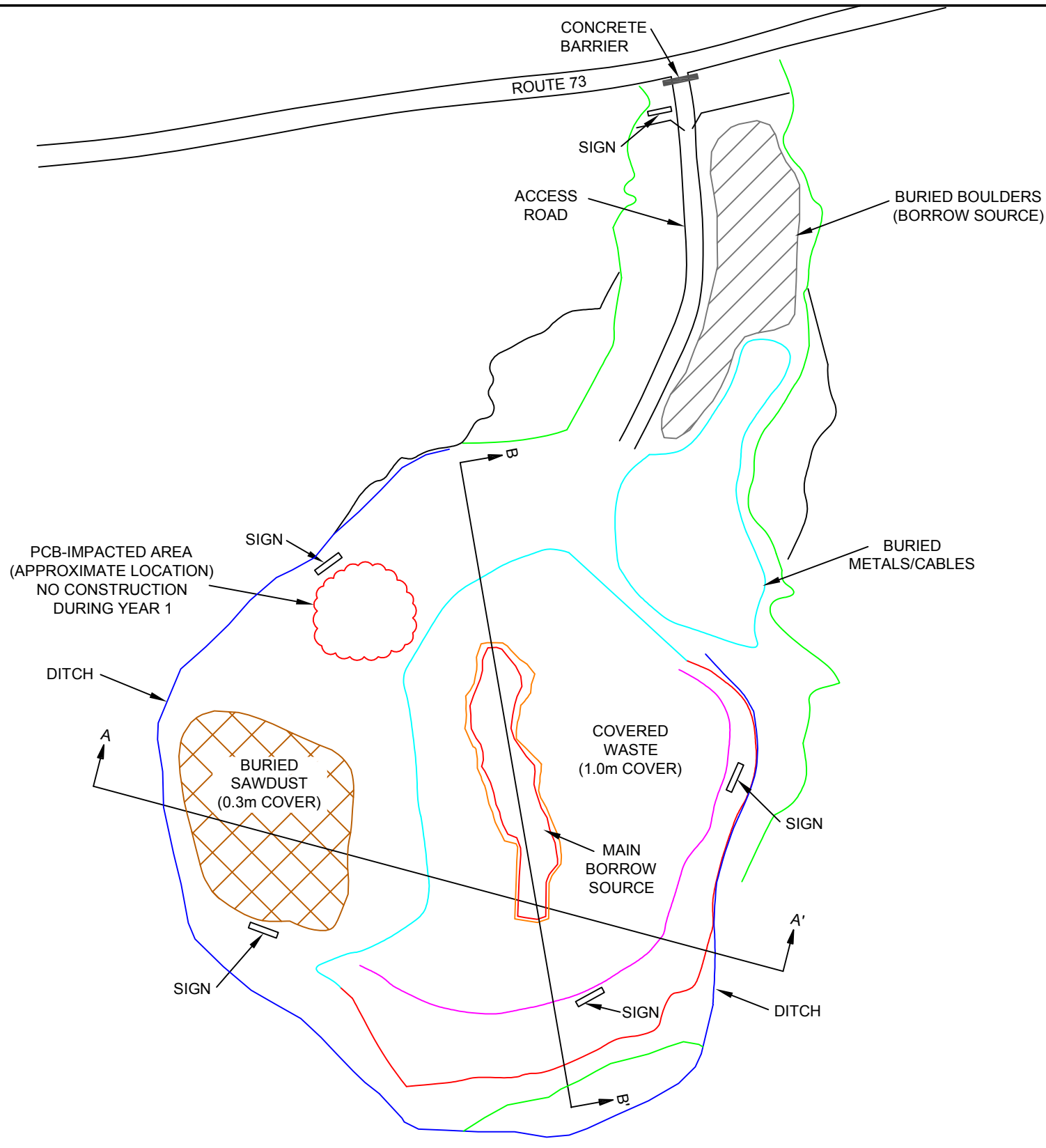
SECTION D-D'

- LEGEND:**
- EXISTING GROUND SURFACE
 - PROPOSED GROUND SURFACE
 - - - PROPOSED WASTE SURFACE

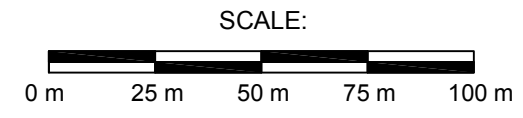
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CLIENT:  Government of Newfoundland and Labrador Department of Environment and Conservation	DWN BY: A. Hollett	PROJECT: NEW HARBOUR WASTE DISPOSAL SITE INTERIM COVER	DATE: March 2012
	CHK'D BY: C. Smith	TITLE: PRE-CONSTRUCTION CROSS SECTIONS	PROJECT No. TF1112732
AMEC Environment & Infrastructure 133 Crosbie Road St. John's, NL A1B 4A5 709-722-7023		SCALE: As Shown	REV. No. 0
			DRAWING No. 2



- LEGEND:**
- SITE BOUNDARY (APPROX.)
 - DITCH
 - TOP OF SLOPE
 - TOE OF SLOPE
 - BURIED WASTE
 - SAWDUST
 - TREELINE
 - TOP OF TRENCH
 - TOE OF TRENCH



NOTES:

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CLIENT:
 Government of Newfoundland and Labrador
 Department of Environment and Conservation

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 A1B 4A5
 709-722-7023



DWN BY:
H. Ryan

CHK'D BY:
C. Smith

SCALE:
As Shown

PROJECT:
NEW HARBOUR WASTE DISPOSAL SITE INTERIM COVER

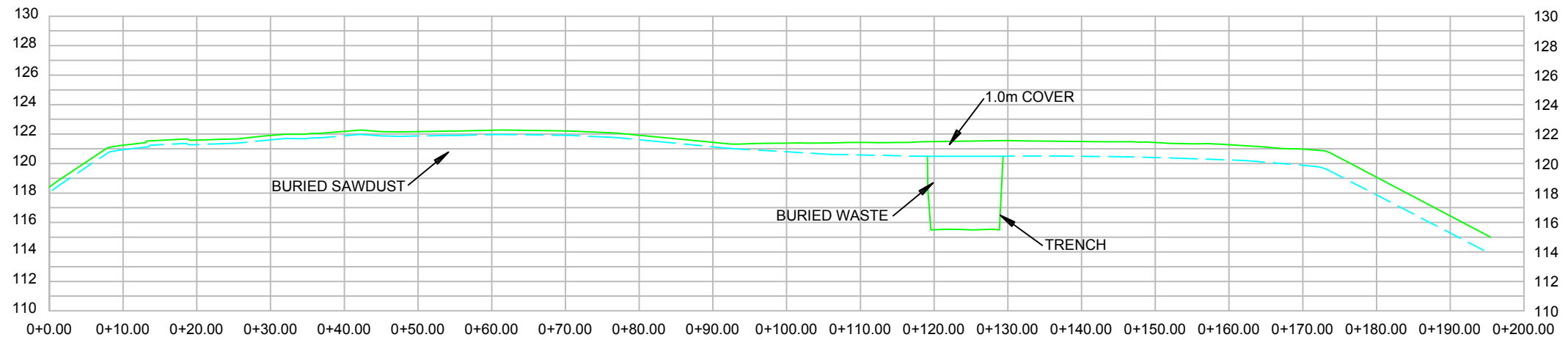
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EXISTING SITE PLAN - AS-BUILT

DATE:
March 2012

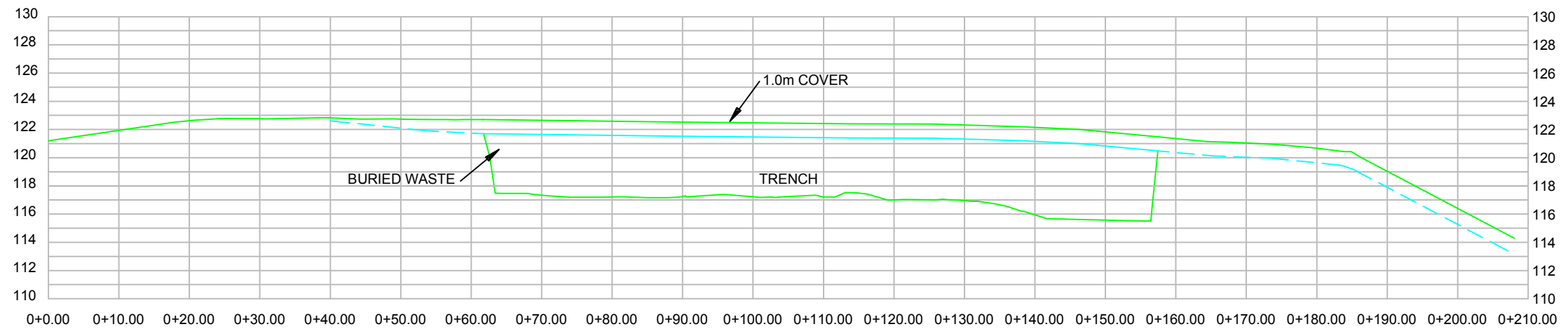
PROJECT No.
TF1112732

REV. No.
0

DRAWING No.
3



SECTION A-A'



SECTION B-B'

LEGEND:

- EXISTING GROUND
- - - TOP OF BURIED WASTE

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CLIENT:



Government of Newfoundland and Labrador

Department of Environment and Conservation

AMEC Environment & Infrastructure

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A1B 4A5
709-722-7023



DWN BY:

H. Ryan

CHK'D BY:

C. Smith

SCALE:

As Shown

PROJECT:

NEW HARBOUR WASTE DISPOSAL SITE INTERIM COVER

TITLE:

CROSS SECTIONS - AS-BUILT

DATE:

March 2012

PROJECT No.

TF1112732

REV. No.

0

DRAWING No.

4

APPENDIX B

SITE PHOTOS



Photo 1 – West waste stockpile (Nov 14)



Photo 2 – East waste stockpile (Nov 14)



Photo 3 – After windrowing the waste to obtain access to the borrow (Nov 14)



Photo 4 – Northeast stockpile being moved to the East stockpile (Nov 14)



Photo 5 – Metals stockpile being removed (Nov 14)



Photo 6 – South facing slope being re-graded



Photo 7 – East stockpile (looking East) (Nov 14)



Photo 8 – Re-graded waste (looking Southeast) (Nov 14)



Photo 9 – Waste being placed in the trench (Nov 17)



Photo 10 – Partially filled trench (Nov 18)



Photo 11 – Excavator and dozer placing waste in the trench (Nov 18)



Photo 12 – Typical trench conditions (Nov 22)



Photo 13 – Re-graded waste looking East (Leachate collection pond access Road in foreground) (Nov 22)



Photo 14 – Typical boulders encountered during trench excavation (Nov 22)



Photo 15 – East slope re-graded (looking South) (Nov 22)



Photo 16 – East waste stockpile being placed in trench (Nov 22)



Photo 17 – Excavators placing waste from the East stockpile into the trench (Nov 23)



Photo 18 – South slope covered and compacted (Nov 23)



Photo 19 – Sawdust area (Nov 25)



Photo 20 – Sawdust area with nets (looking South) (Nov 25)



Photo 21 – Typical placement of interim cover (Nov 25)



Photo 22 – East stockpile removed (looking Southeast) (Nov 29)



Photo 23 – West stockpile being removed (Nov 29)



Photo 24 – Excavated site access road showing thin layer of waste (Dec 6)



Photo 25 – Sawdust area re-graded (Dec 8)



Photo 26 – Sawdust area covered (looking Southwest) (Dec 14)



Photo 27 – Typical boulders encountered in main borrow source (Dec 14)



Photo 28 – Covered trench (Dec 14)



Photo 29 – Large boulders in main borrow source (Dec 14)



Photo 30 – Covered boulders (Dec 20)



Photo 31 – Covered boulders (Dec 22)