Environment

Defence Construction Canada

DYE-M Cape Dyer
Year 1 Landfill Monitoring

Prepared by:

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Project Number:

60323208 (0171/Landfill Monitoring)

Date:

November 19, 2015

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AECOM: 2012-01-06

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November 19, 2015

Nahed Farah
Defence Construction Canada
DCC Major Programs
180 Kent Street
Ottawa, ON K1P 0B6

Dear Mr. Farah:

Project No: **60323208 (0171/Landfill Monitoring)**

Regarding: **DYE-M Cape Dyer Year 1 Landfill Monitoring**

AECOM is pleased to submit the DYE-M Cape Dyer Year 1 Landfill Monitoring report. We trust this meets your current requirements.

Should you require any additional information, please do not hesitate to contact the undersigned at (780) 930-0040 at your convenience.

Sincerely,
AECOM Canada Ltd.

Roland Merkosky, P.Eng.
Project Manager
roland.merkosky@aecom.com

RRM:cn

Distribution List

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	Katie Scott	April 9, 2015	Draft
1	Katie Scott	November 19, 2015	Final

AECOM Signatures

Report Prepared By:

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Report Reviewed By:

Roland Merkosky, P.Eng.
Project Manager

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1. Introduction

1.1 Background

The DYE-M Distant Early Warning (DEW) Line Station, Cape Dyer, is located on the easternmost point of Baffin Island at 66°40' N 61°21' W in the territory of Nunavut. The station is located about 15 kilometres (km) inland from the Sunneshine Fiord shore. The DYE-M station was constructed in 1956 and 1957 and was one of the larger radar sites in the Arctic. In 1993, the site was upgraded to an unmanned Long Range Radar site as part of the North Warning System (NWS). Much of the station infrastructure was no longer required. Only the structures supporting the operation of the Long Range Radar (LRR) are still in use.

The overall site has been broken into three areas as shown on Figure DYE-M.1:

- The Upper Site consists of the former main radar installations, the existing Module trains and the support facilities located at the high point of the site, approximately 19 km from the Beach Landing area. There are four remediated historical landfills and two constructed facilities or landfills in the area.
- The Lower Site was used to provide logistical support to the site and includes the Hangar; the Airstrip and is connected to the beach area, the western borrow sources and the Middle and Upper sites by road. The Lower Site includes the Beach area where the Fuel storage facilities and marine landing area are located. The Lower Site area has five remediated historical landfills, two constructed facilities or landfills and the site of the former DLCU remediation camp.
- The Middle Site was the former location of a fuel pumping station and contains Borrow Area 3 where a large amount of remediation fill was sourced.

A Tier II Disposal Facility and a Non-Hazardous Waste Landfill were constructed at both the Upper and Lower Sites for the disposal of contaminated soil and demolition waste and debris respectively.

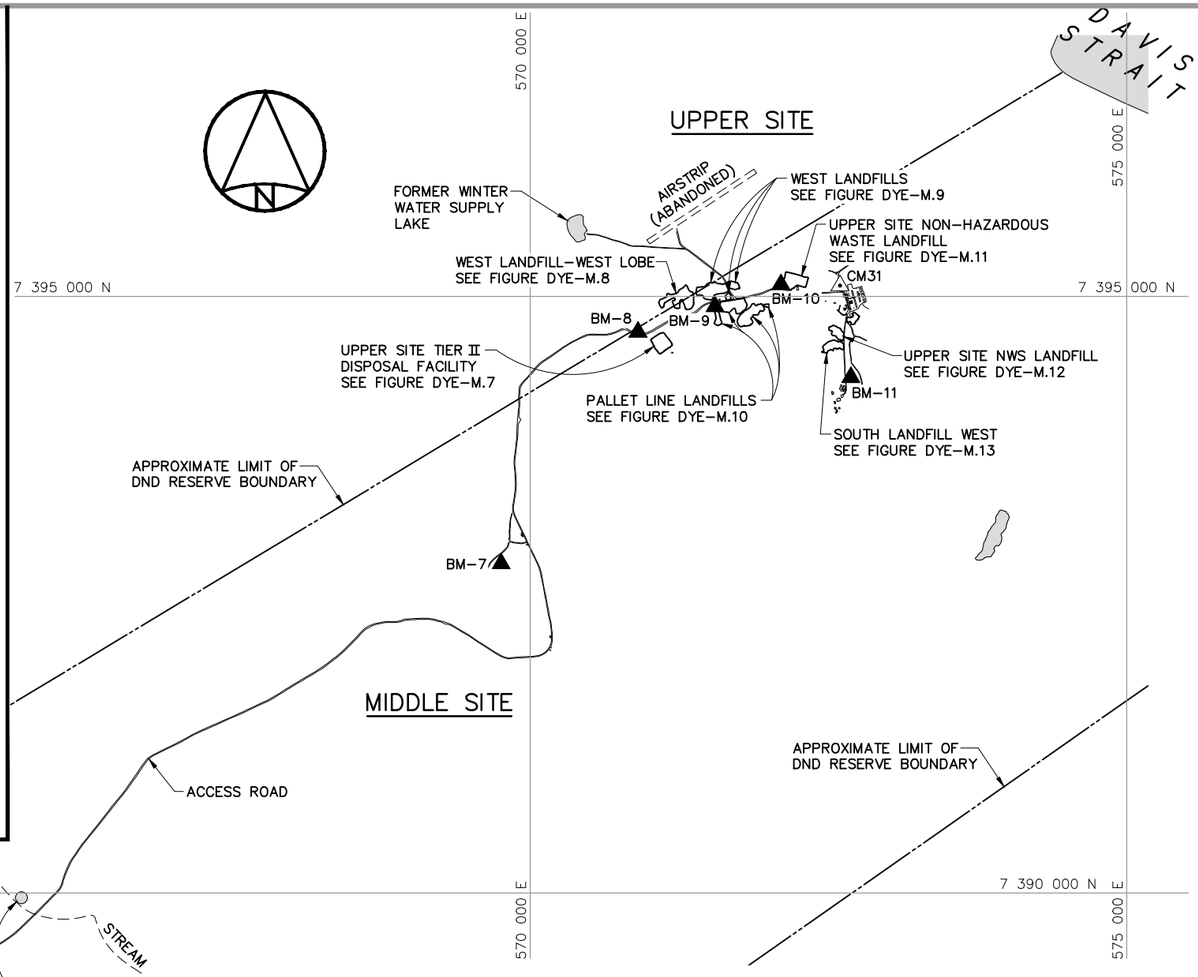
1.2 Scope of Work

The general components of the landfill monitoring program at DYE-M include:

- Visual inspection
- Surface and shallow depth soil sampling and analyses (performed and reported by others)
- Groundwater sampling and analyses (performed and reported by others)
- Ground temperature monitoring

The requirements for landfill monitoring, as laid out in Environmental Provisions of the NTI-DND Agreement, are summarized in Table 1-1. Detailed landfill monitoring requirements are described in the Landfill Monitoring Plan - Part B - Nunavut Settlement Region. A copy of the performance/severity rating and extent system used to determine the overall landfill performance has been provided below.

LOCATION OF CAPE DYER WITHIN NUNAVUT TERRITORY
SCALE: NTS



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- CM1 — SURVEY CONTROL MONUMENT (2)
- BM-1 — PERMANENT BENCHMARK LOCATION (11)
- ARCHAEOLOGICAL FEATURES
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- BODY OF WATER

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM1	7 387 216.050	563 094.868	369.117	GSC REF. MONUMENT 749187
CM31	7 395 089.583	572 596.681	738.753	DYE-M BASELINE STA. 0+00

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-1	7 386 856.572	560 210.986	28.859	PERMANENT BENCHMARK
BM-2	7 386 436.131	560 584.268	56.421	PERMANENT BENCHMARK
BM-3	7 388 784.458	561 678.997	303.149	PERMANENT BENCHMARK
BM-4	7 388 298.061	562 101.426	335.054	PERMANENT BENCHMARK
BM-5	7 388 091.843	562 262.991	346.862	PERMANENT BENCHMARK
BM-6	7 387 476.806	562 631.270	363.205	PERMANENT BENCHMARK
BM-7	7 392 760.781	569 757.212	470.316	PERMANENT BENCHMARK
BM-8	7 394 701.849	570 903.508	623.679	PERMANENT BENCHMARK
BM-9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK
BM-10	7 395 099.840	572 102.072	721.812	PERMANENT BENCHMARK
BM-11	7 394 320.996	572 688.263	722.905	PERMANENT BENCHMARK

RECORD DRAWING
NOT FOR CONSTRUCTION

0 500 1000 m SCALE 1:50000

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOCATION PLAN

FIGURE DYE-M.1

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Table 1-1: General Landfill Monitoring Requirements

Landfill Classification	Visual Inspection	Groundwater Sampling	Soil Sampling	Thermal Monitoring
Existing Landfill, High Potential Environmental Risk (Class A)	Not required, as landfill to be excavated.			
Existing Landfills, Moderate Potential Environmental Risk (Class B)	√	√	√	√
Existing Landfills, Low Potential Environmental Risk (Class C)	√		√	
New Landfill, Non-Hazardous Waste Landfill	√	√	√	
New Landfill, DCC Tier II Disposal Facility	√	√	√	√

Table 1-2: Performance/Severity Rating System

Performance/ Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion and settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as settlement, erosion, or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: • Debris exposed in erosion channels or areas of settlement • Liner exposed • Slope failure

Table 1-3: Extent Rating System

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

A summary of these requirements, as related to the specific landfills at DYE-M, is provided in Table 1-4.

Table 1-4: DYE M Cape Dyer Landfill Monitoring Requirements

Landfill Designation	Landfill Classification	Visual Inspection	Groundwater Sampling	Soil Sampling	Thermal Monitoring
Lower Site					
Lower Site NWS Landfill	Low Risk Regrade	√		√	
Lower Site Tier II Disposal Facility	New Construction	√	√	√	√
Crossroads Landfill	Low Risk Regrade	√		√	
Foundation Landfill	Low Risk Regrade	√		√	
Powerhouse Landfill	Moderate Risk Leachate Contain	√	√	√	√
Lower Site Non-Hazardous Waste Landfill	New Construction	√	√	√	
Upper Site					
Upper Site Tier II Disposal Facility	New Construction	√	√	√	√
West Landfill – West Lobe	Low Risk Regrade	√		√	
West Landfill – Centre Lobe, Centre Lobe A and East Lobe	Low Risk Regrade	√		√	
Pallet Line Landfill Lobes	Low Risk Regrade	√		√	
Upper Site Non-Hazardous Waste Landfill	New Construction	√	√	√	
Upper Site NWS Landfill	Low Risk Regrade	√		√	
South Landfill West	Low Risk Regrade	√		√	

1.3 Methodology

1.3.1 Field Program and Staff

The on-site field program at DYE-M was completed on August 10, 11, 12, 13, 14 and 18, 2014, by the AECOM person at the DYE-M site who was providing geotechnical support to the NWS gravel production and Airstrip resurfacing project. The field program was executed by Matt Lotecki of AECOM between his responsibilities on the NWS project.

1.3.2 Weather Conditions

Temperatures at site during the monitoring program were generally between 5 to 12 degrees Celsius (°C) during the daytime hours. Wind speeds at the time of monitoring were between 41 and 85 kilometres per hour (km/h) in an approximately north northeast direction. It was generally partly cloudy.

1.3.3 Visual Inspection

The physical condition of each landfill is inspected in accordance with the Visual Inspection Checklist provided in the Environmental Provisions of the NTI-DND Agreement. Documented observations include evidence of settlement, ponding, frost action, erosion and lateral movement, sloughing of berms, and thermal contraction cracks.

Documentation of observations is supported using hand drawn sketches, as applicable. Photographic records are provided to document the general condition of the landfill and to substantiate all recorded observations. High resolution, .jpg versions of all photos taken during monitoring are presented in Appendix C on the DVD.

1.3.4 Thermal Monitoring

Tier II Disposal Facilities and Leachate Contained Class B landfills are designed to include the placement of sufficient fill to promote aggradation of permafrost through the landfill contents. For design, geothermal modeling is conducted to determine the maximum depth of active layer at the landfill over time and the amount of fill required over the landfill contents to avoid active layer penetration. Geothermal modelling considers soil type, soil thermal properties, presence or absence of insulating cover (vegetation or snow drift), measured ground temperatures at the site or at nearby sites, measured air temperature and climatic data (1956 to 1990 climate normals data from Environment Canada for Cape Hooper, Nunavut), a calculated 1 in 100 warm year air temperature, and an estimate of the effect of global warming.

To verify that the landfills are performing as modelled, strings of thermistor beads have been installed at key locations within the landfills that are designed to freeze back. All thermistors at the Lower Site Tier II Disposal Facility, the Powerhouse Landfill and the Upper Site Tier II Disposal Facility were inspected and were found to be in generally good condition. Bead number one of VT-6 at the Powerhouse Landfill appears to be malfunctioning; this bead is located 0.15 metres (m) above the ground level and reads ambient air temperatures. Beads 3, 5 and 6 of VT-BL, the background thermistor located at the Lower Site also appeared to be malfunctioning. The battery levels were checked in all thermistors and appear to be good. The dates of battery production are listed on the thermistor maintenance logs included in each landfill section below. Thermistor installation logs have also been included in Appendix A.

1.3.5 Field Notes

Field notes from the monitoring program have been included in Appendix B. They include the hand-written thermistor maintenance logs and landfill figures with photo viewpoints and any features that were noted.

2. Lower Site NWS Landfill

2.1 Visual Inspection

The visual inspection of the Lower Site NWS Landfill was completed on August 11, 2014. The NWS Landfill at the Lower Site is located approximately 2.5 km northwest of the Lower Station Area facilities. It is in an area that was formerly used as a granular borrow source on the north side of a river. The extent of the buried material is approximately 3,000 square metres (m^2), based on the geophysical survey and visual assessment. The capping material of the landfill was 0.5 m Type 2 granular fill. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

2.1.1 Settlement

Isolated minor tension cracks were noted on the top surface of the landfill during the inspection along with sparse areas of vegetation. Other indications of consolidation or settlement were not observed.

2.1.2 Erosion

There were no erosion features noted.

2.1.3 Frost Action

Frost action was not observed at the site.

2.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

2.1.5 Re-establishment of Vegetation

There were occasional areas of vegetation on the side slopes of the landfill and top surface. Approximately 1% of the extent of the landfill was covered with individual plants up to 100 millimetres (mm) in height.

2.1.6 Staining

There was no staining noted.

2.1.7 Seepage Points

Seepage was not noted at the landfill.

2.1.8 Debris

Surface debris was not observed.

2.1.9 Discussion

There was no substantial evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable. Occasional tire tracks were noted on the surface of the landfill.

561 350 E
561 400 E
561 450 E
561 500 E
7 388 950 N
7 388 900 N

ACCESS ROAD

FEATURE B
SPARSE VEGETATION

FEATURE C
VARIOUS MISC. TIRE TRACKS

FEATURE A
MINOR CRACKS (1.5m X 0.5m)

DM-07
DM-08
DM-09
DM-10

260 261 262 263 264 265

86 87 88 89 84 85

LOWER SITE NWS LANDFILL (REGRADED)

RIVER

292m 293m 294m 291m 290m 289m 288m 287m 286m 285m

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LEGEND:

- 260 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (4)
- CRACKING (NTS)
- SPARSE VEGETATION
- TIRE TRACKS (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- BODY OF WATER

RECORD DRAWING
NOT FOR CONSTRUCTION

0 5 10 m SCALE 1:500

LOWER SITE NWS LANDFILL REGRADED (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
260	7 388 930.4	561 376.0	293.3
261	7 388 956.2	561 393.3	294.6
262	7 388 940.4	561 438.1	292.0
263	7 388 931.6	561 450.7	291.1
264	7 388 896.9	561 434.5	289.2
265	7 388 919.0	561 388.0	293.0

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE NWS LANDFILL

FIGURE DYE-M.2

2.2 Photographic Record

Photos 84 through 89

Photograph 84. **Northeast corner looking south ↑**

Photograph 85. Minor tension cracks in the landfill surface ↑

Photograph 86. Northeast side slope looking east ↑

Photograph 87. Looking northeast from the southeast corner ↑

Photograph 88. Tire tracks on surface of landfill ↑

Photograph 89. Landfill overview, looking west ↑

2.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Lower Site NWS Landfill
Date of Inspection:	11-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky

The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Signature: 

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No	Feature A - Minor tension cracks near the East corner of the top surface.	Approximately 1.5 m	Approximately 0.5 m		Less than 1%		Picture 085		Occasional	Acceptable
Animal Burrows	No									None	
Vegetation	Yes	Feature B - Occasional areas of vegetation were found on sides of landfill (refer to drawing for specific locations). Occasional individual pieces of vegetation were found on the top surface.	Areas: up to approximately 5 m Individual: up to 100 mm	Areas: up to approximately 1 m Individual: up to 100 mm	Up to 100 mm tall	Extent of areas cover approximately 1%		Pictures 084 - 089		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Feature C - Tire tracks observed on surface of landfill.				Less than 1%.		Pictures 088, 089		Occasional	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Lower Site NWS Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

3. Lower Site Tier II Disposal Facility

3.1 Visual Inspection

The visual inspection of the Lower Site Tier II Disposal Facility was completed on August 14, 2014. The landfill is located to the northeast of the crossroads on the lower site. The capping material of the landfill was 3.9 m Type 2 granular fill. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

3.1.1 Settlement

Indications of settlement were not noted.

3.1.2 Erosion

There were no erosion features noted.

3.1.3 Frost Action

Frost action was not observed at the site.

3.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

3.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

3.1.6 Staining

There was no staining noted during this inspection.

3.1.7 Seepage Points

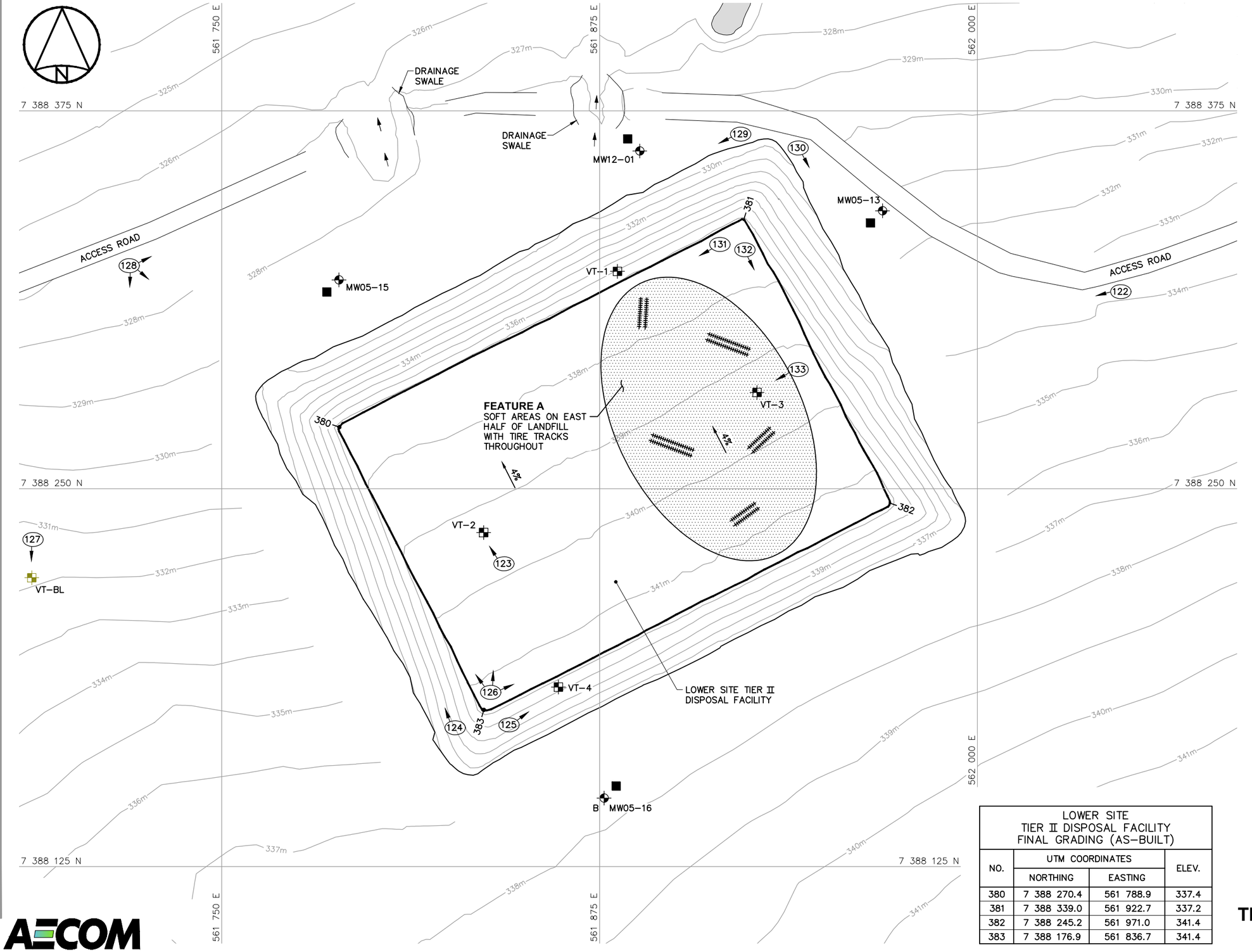
Seepage was not noted at the landfill.

3.1.8 Debris

Surface debris was not observed.

3.1.9 Discussion

The occasional tire track, covering less than 1% of the surface, was observed on the surface of the landfill in soft areas. As there was no evidence of settlement or slope stability issues, the landfill performance is acceptable.



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LEGEND:

- 380 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (5)
- MONITORING SOIL SAMPLE LOCATION (4)
- SOFT AREA
- TIRE TRACKS (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

LOWER SITE
TIER II DISPOSAL FACILITY
MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-13	7 388 341.9	561 968.6	331.3
MW05-15	7 388 319.1	561 788.8	328.5
MW05-16	7 388 147.7	561 876.5	337.5
MW12-01	7 388 361.7	561 888.3	328.6

LOWER SITE
TIER II DISPOSAL FACILITY
GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-1	7 388 321.9	561 880.9	336.3
VT-2	7 388 235.5	561 836.6	339.4
VT-3	7 388 281.8	561 927.1	339.4
VT-4	7 388 184.4	561 861.4	340.4
VT-BL	7 388 226.9	561 629.6	330.4

LOWER SITE
TIER II DISPOSAL FACILITY
FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
380	7 388 270.4	561 788.9	337.4
381	7 388 339.0	561 922.7	337.2
382	7 388 245.2	561 971.0	341.4
383	7 388 176.9	561 836.7	341.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE TIER II DISPOSAL FACILITY

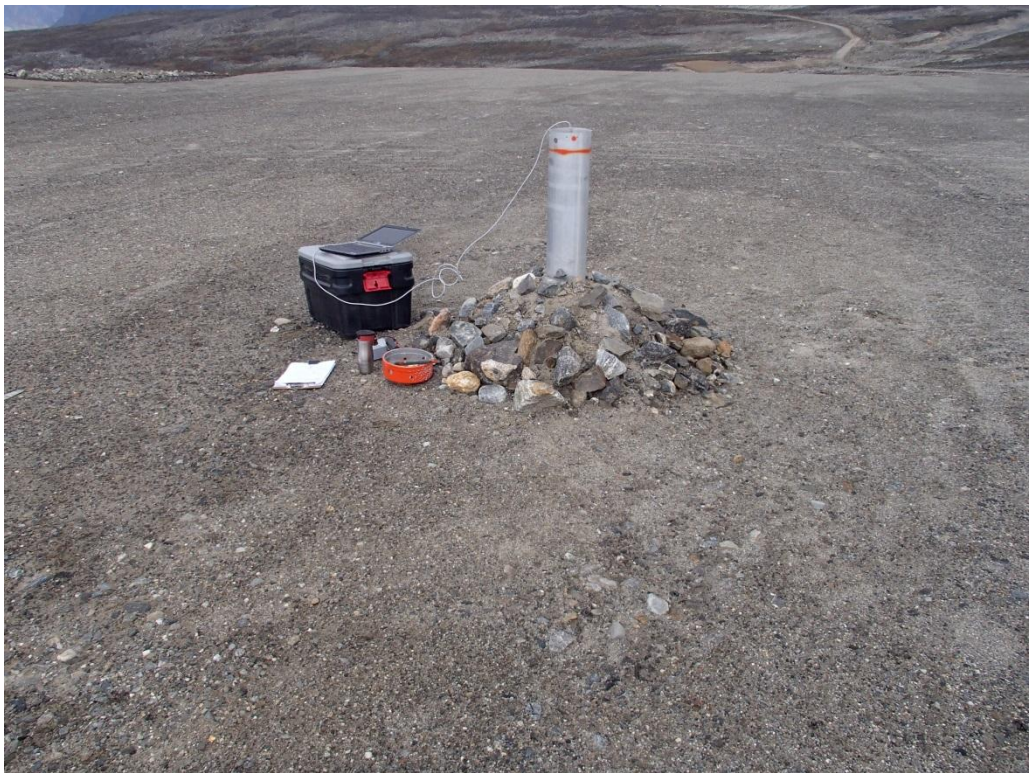
FIGURE DYE-M.3

AECOM

3.2 Photographic Record

Photos 122 through 133

Photograph 122. Overview of landfill, looking west ↑



Photograph 123. VT-2 ↑

Photograph 124. **South corner looking northwest ↑**

Photograph 125. **South corner looking northeast ↑**

Photograph 126. South corner looking at surface of the landfill ↑

Photograph 127. Lower site background thermistor ↑

Photograph 128. Overview of the landfill from the northeast side ↑

Photograph 129. Looking west from the northeast corner ↑

Photograph 130. Looking south from the northeast corner ↑

Photograph 131. **On top of the north corner of the landfill looking west ↑**

Photograph 132. **On top of the north corner of the landfill looking south ↑**

Photograph 133. Looking west across soft area on landfill surface, as evidenced by tire tracks ↑

3.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Lower Site Tier II Disposal Facility
Date of Inspection:	14-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	Yes							Pictures 123, 125, 127, 133			
Features of Note	Yes	Feature A - Tire tracks observed on surface of landfill in the soft areas.				Less than 1%.		Picture 133		Occasional	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Lower Site Tier II Disposal Facility
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

3.4 Thermistor Data – Tier II Facility and Background Thermistor (Borrow Area 13)

THERMAL MONITORING ANNUAL DATA ANALYSIS

Site: **DYE-M Cape Dyer Lower Site**
Landfill: **Lower Site Tier II Disposal Facility**

Design Infomation:

Design Active Layer (m):	-3.90
Mean Active Layer (m):	-2.50
1:100 Year Active Layer (m):	-3.30
Mean Thawing Index (degC Days):	330.00
Mean Freezing Index (degC Days):	4110.00
1:100 Year Thawing Index (degC Days):	715.00

Maximum Active Layer (m):

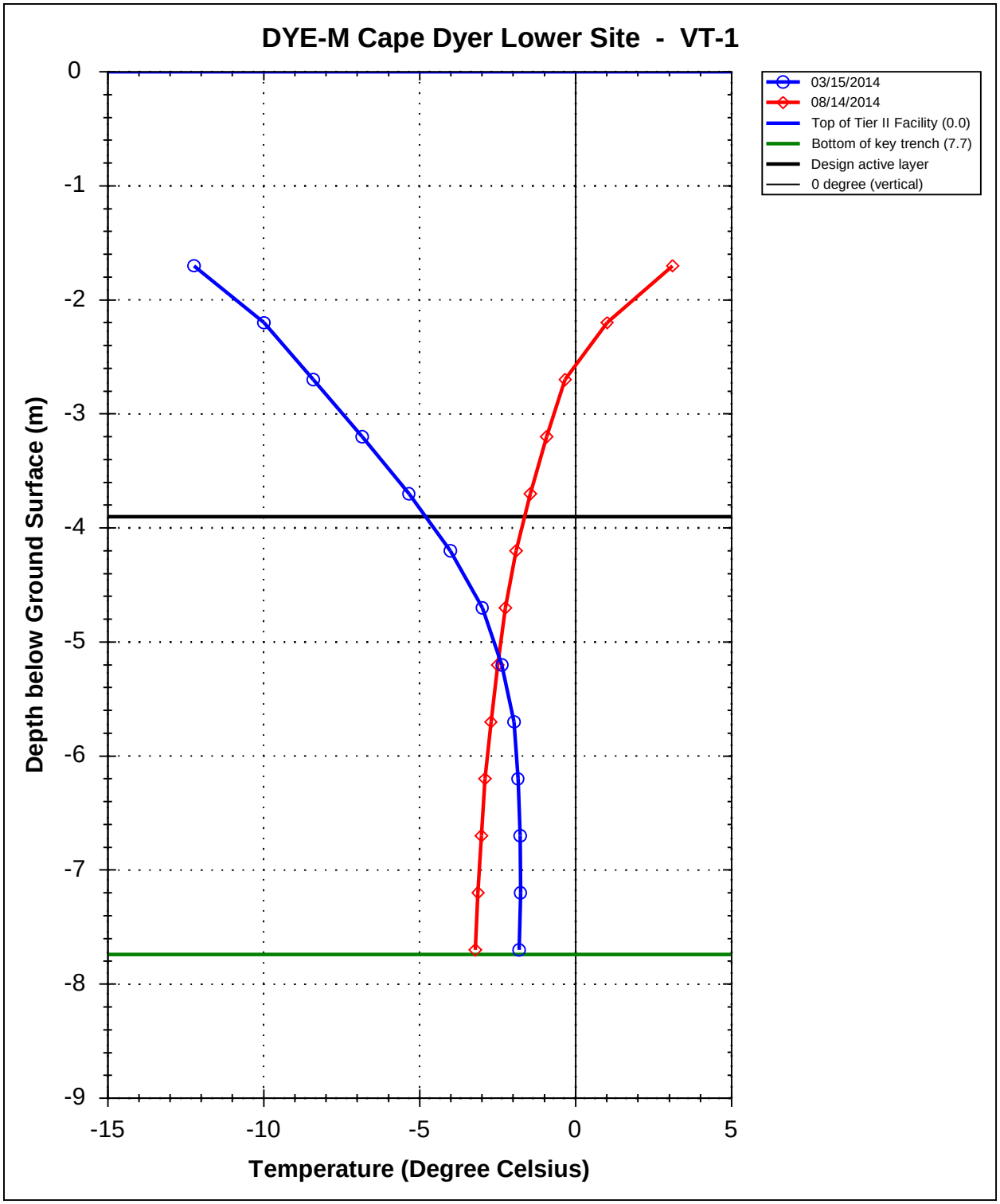
	VT-1	VT-2	VT-3	VT-4
2013	NaN	NaN	NaN	NaN
2014	-4.21	-2.16		

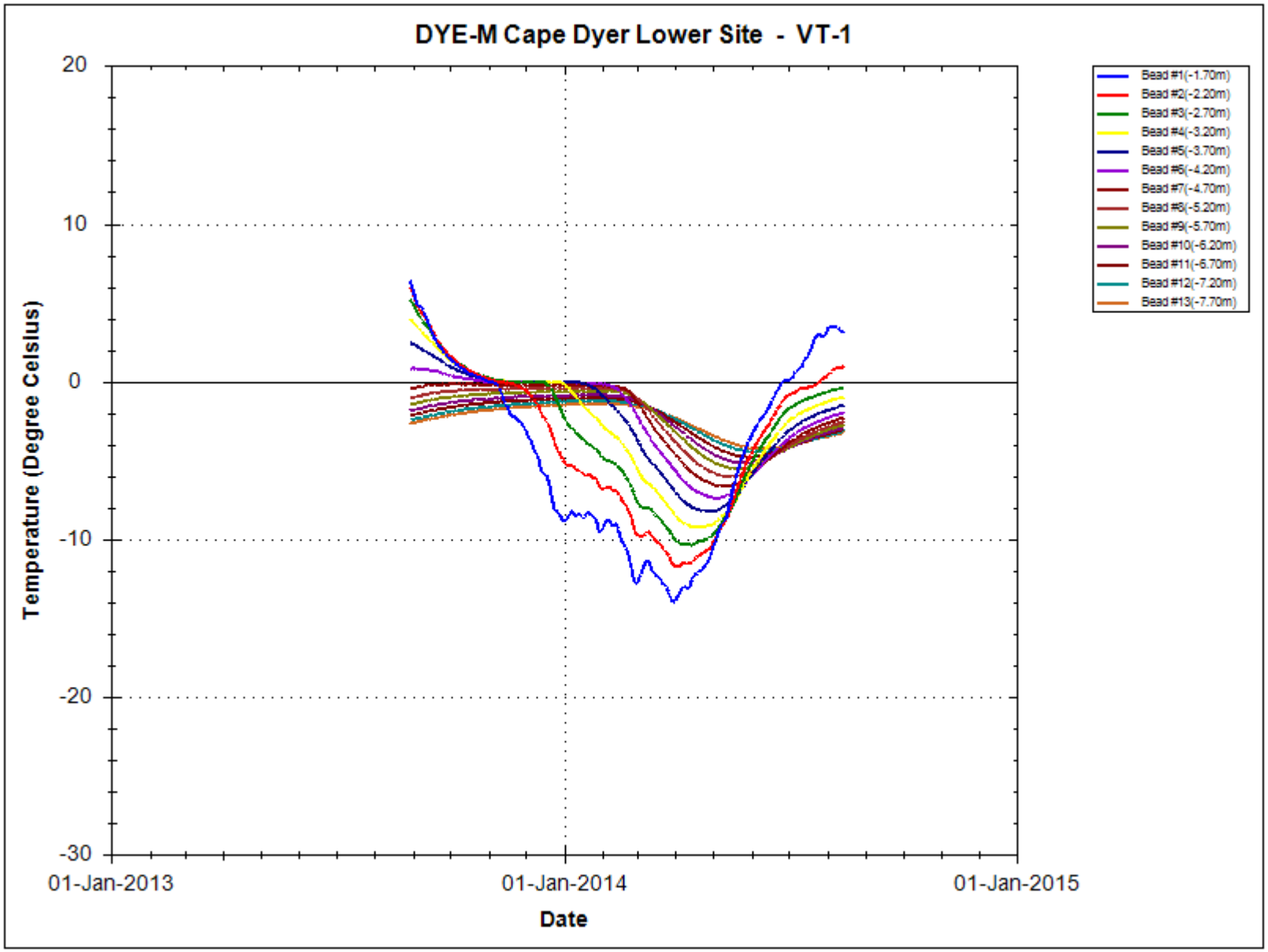
Thawing Index and Freezing Index:

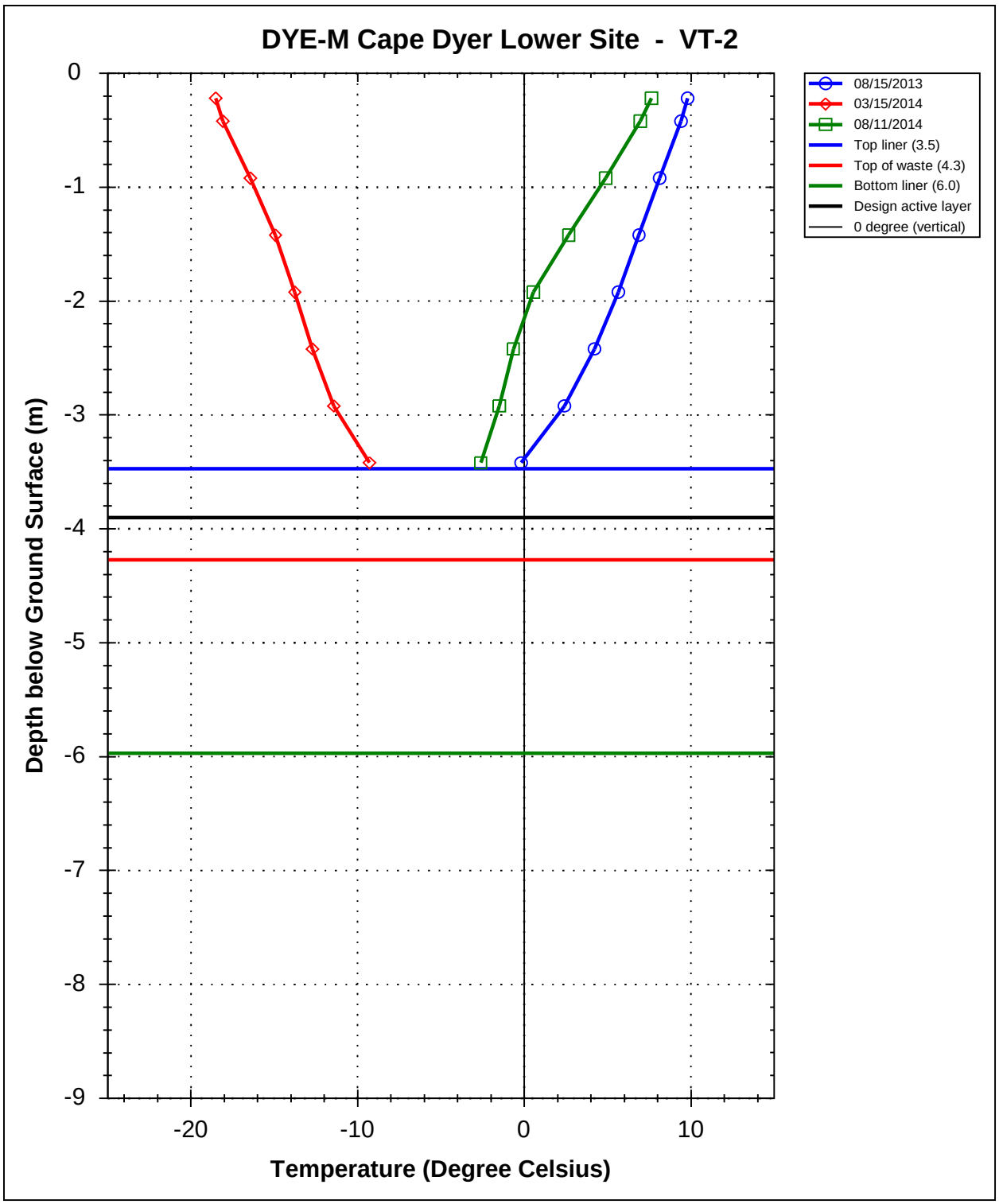
	TI	FI	max AL	min AL	average AL
2013	451.00	3426.00	NaN	NaN	NaN
2014	545.00	3934.00	-4.21	-2.16	-2.82

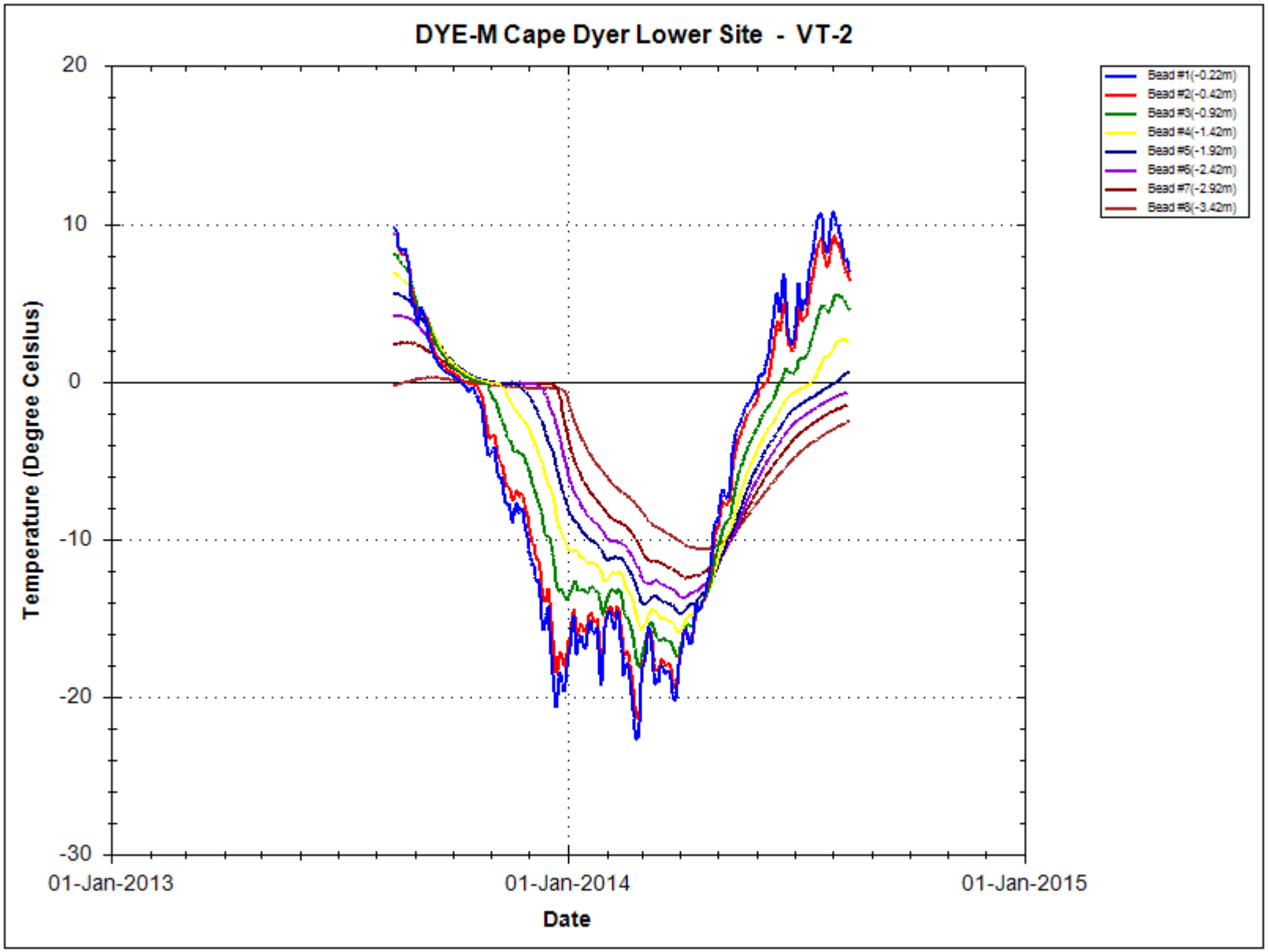
Deepest Bead Average Temperature:

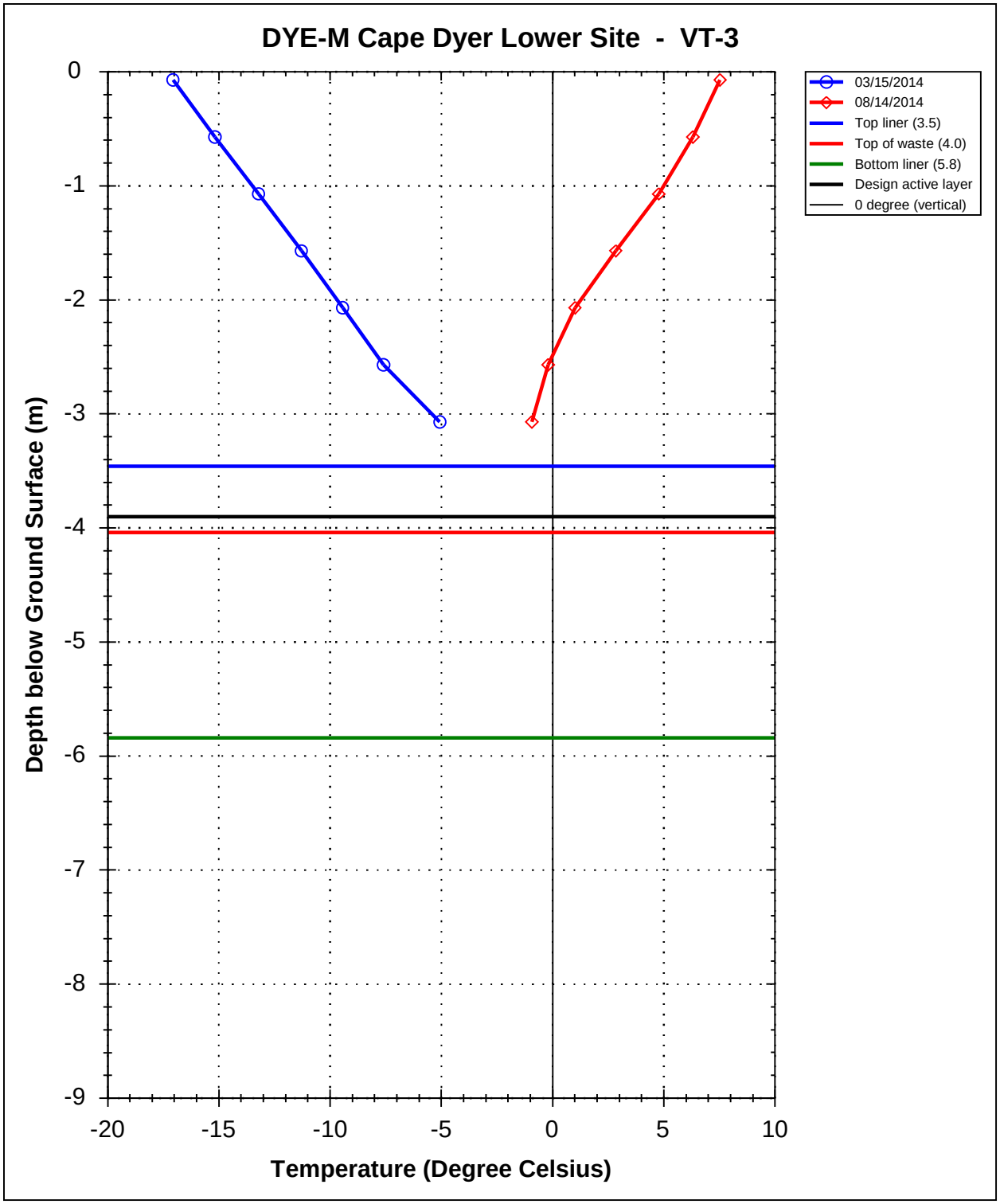
	VT-1	VT-2	VT-3	VT-4	AVG
2013	NaN	NaN	NaN	NaN	NaN
2014	NaN	NaN	NaN	NaN	NaN

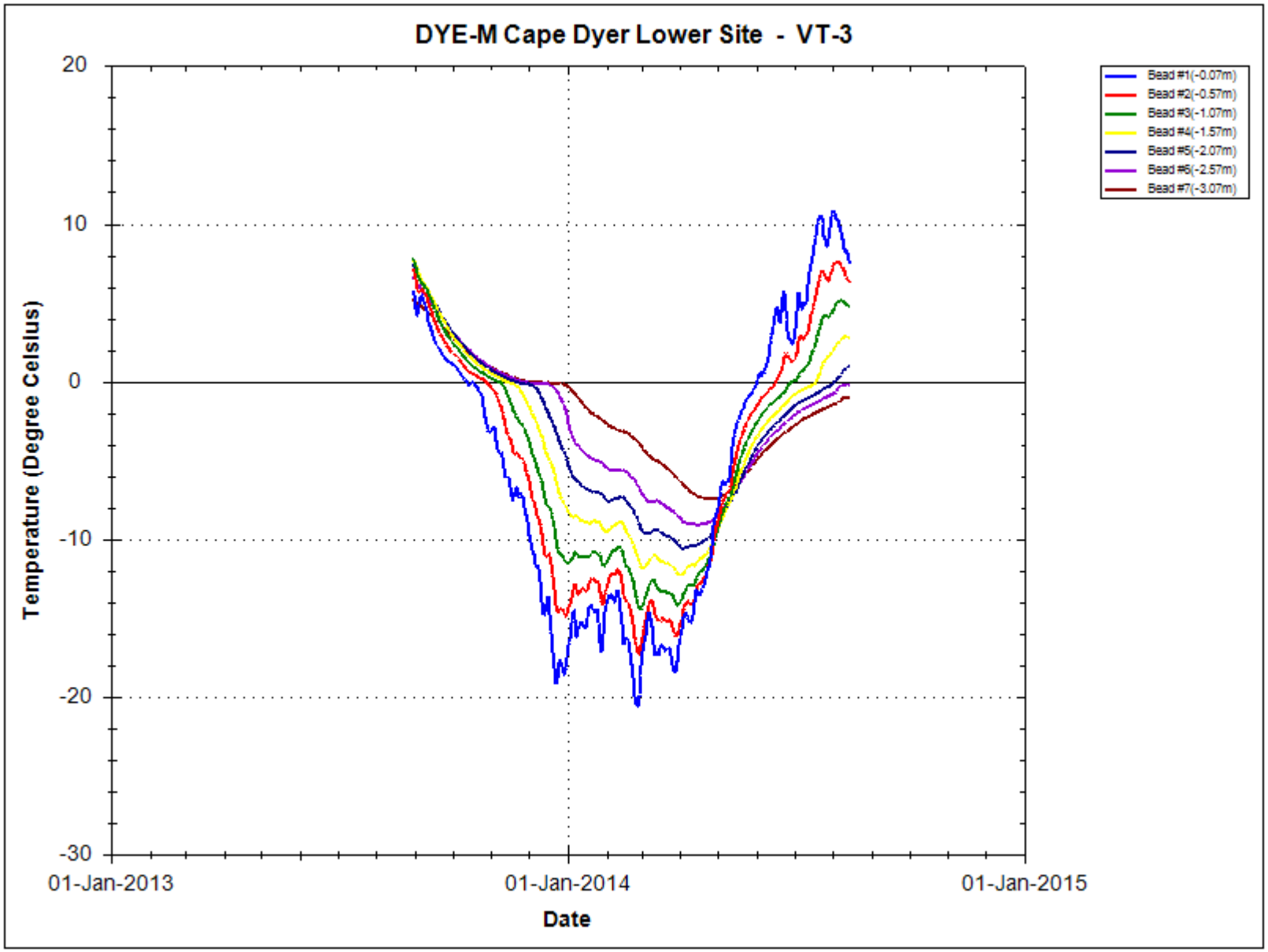

DYE-M Cape Dyer Lower Site - VT-1
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-15
-10
-5
0
5
Temperature (Degree Celsius)
03/15/2014
08/14/2014
Top of Tier II Facility (0.0)
Bottom of key trench (7.7)
Design active layer
0 degree (vertical)

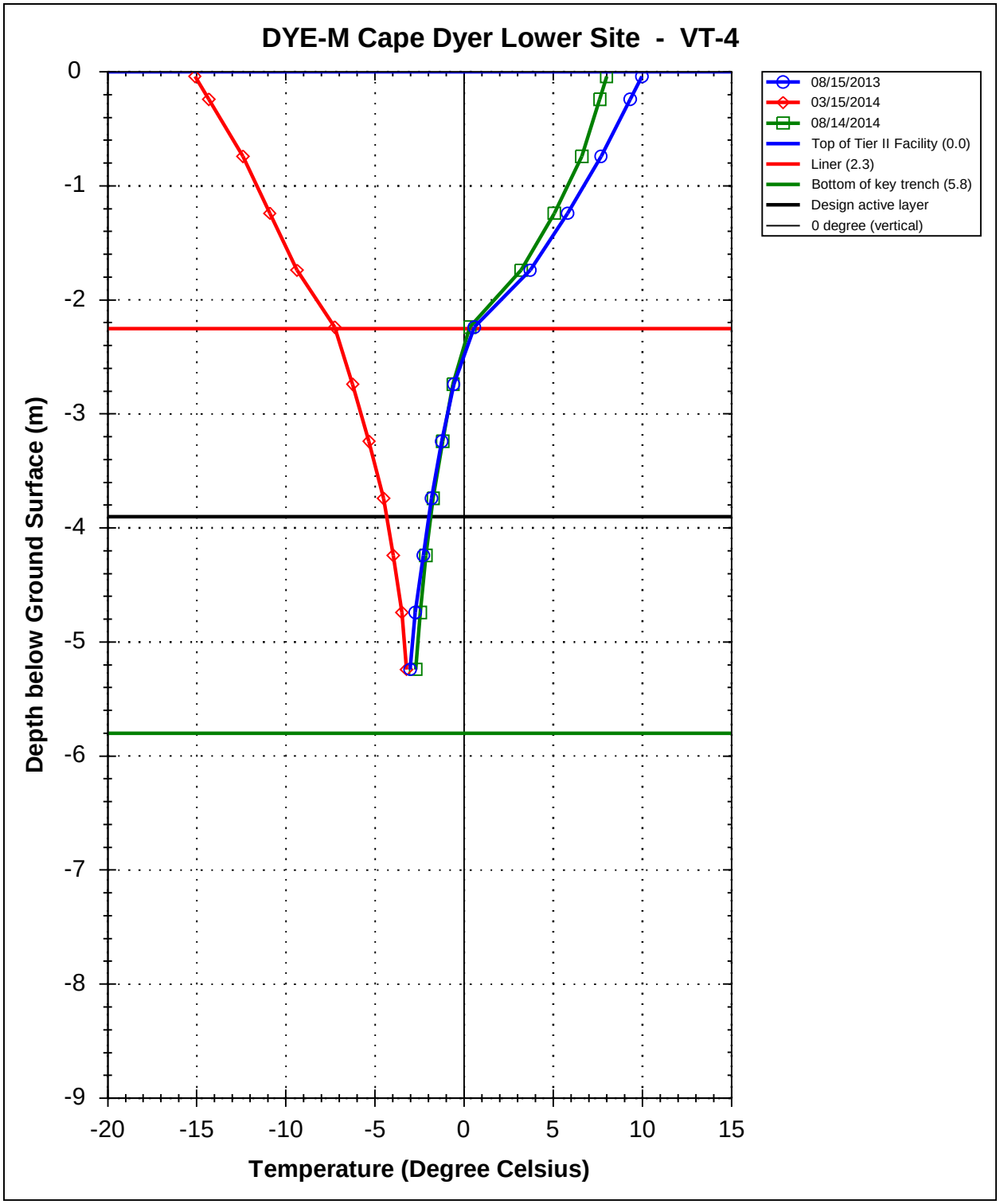

DYE-M Cape Dyer Lower Site - VT-1
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #1(-1.70m)
Bead #2(-2.20m)
Bead #3(-2.70m)
Bead #4(-3.20m)
Bead #5(-3.70m)
Bead #6(-4.20m)
Bead #7(-4.70m)
Bead #8(-5.20m)
Bead #9(-5.70m)
Bead #10(-6.20m)
Bead #11(-6.70m)
Bead #12(-7.20m)
Bead #13(-7.70m)

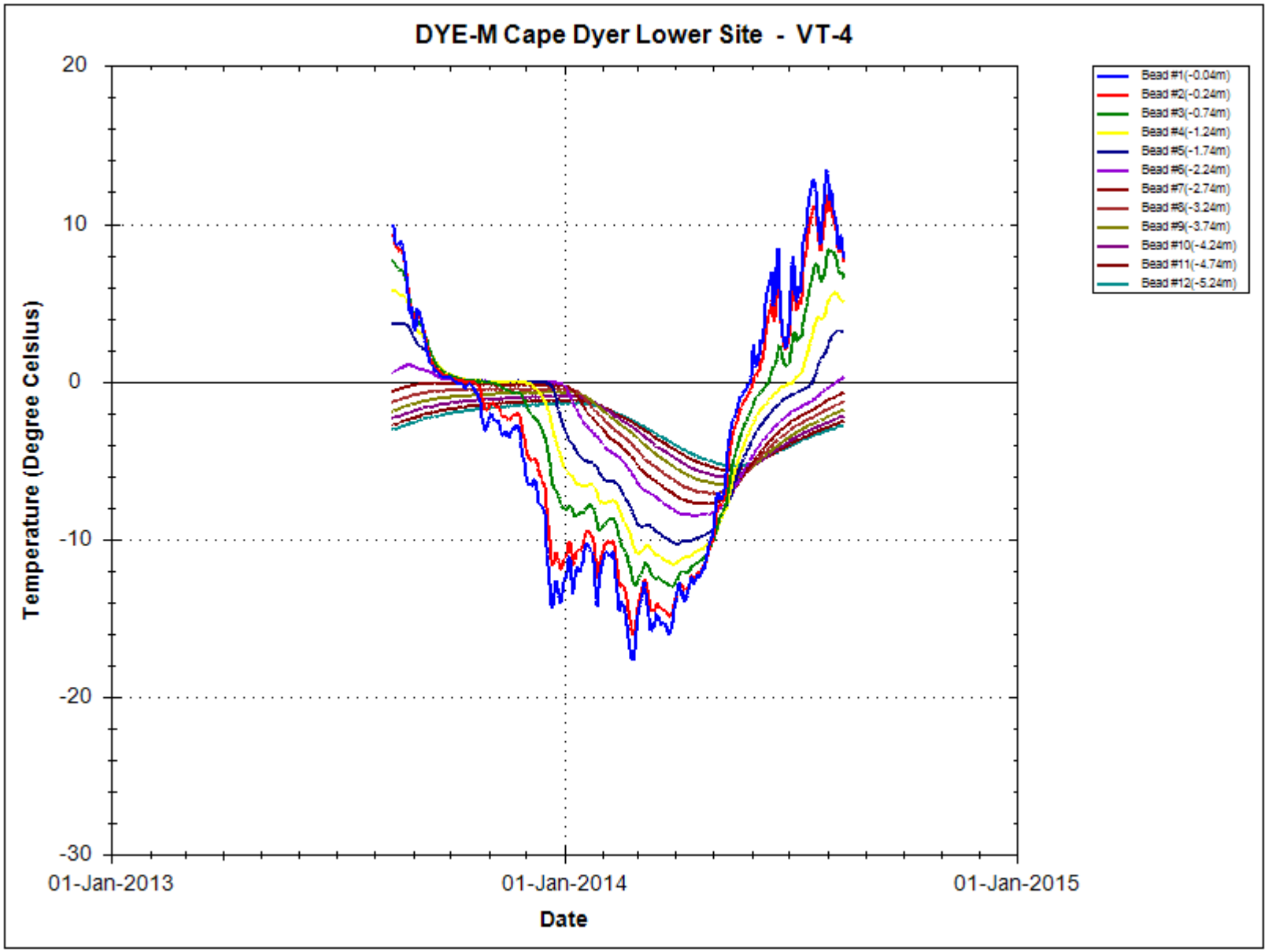

DYE-M Cape Dyer Lower Site - VT-2
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-20
-10
0
10
Temperature (Degree Celsius)
08/15/2013
03/15/2014
08/11/2014
Top liner (3.5)
Top of waste (4.3)
Bottom liner (6.0)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-2
Bead #1(-0.22m)
Bead #2(-0.42m)
Bead #3(-0.92m)
Bead #4(-1.42m)
Bead #5(-1.92m)
Bead #6(-2.42m)
Bead #7(-2.92m)
Bead #8(-3.42m)
20
10
0
-10
-20
-30
Temperature (Degree Celsius)
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date


DYE-M Cape Dyer Lower Site - VT-3
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-20
-15
-10
-5
0
5
10
Temperature (Degree Celsius)
03/15/2014
08/14/2014
Top liner (3.5)
Top of waste (4.0)
Bottom liner (5.8)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-3
Bead #1(-0.07m)
Bead #2(-0.57m)
Bead #3(-1.07m)
Bead #4(-1.57m)
Bead #5(-2.07m)
Bead #6(-2.57m)
Bead #7(-3.07m)
20
10
0
-10
-20
-30
Temperature (Degree Celsius)
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date


DYE-M Cape Dyer Lower Site - VT-4
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-20
-15
-10
-5
0
5
10
15
Temperature (Degree Celsius)
08/15/2013
03/15/2014
08/14/2014
Top of Tier II Facility (0.0)
Liner (2.3)
Bottom of key trench (5.8)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-4
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #1(-0.04m)
Bead #2(-0.24m)
Bead #3(-0.74m)
Bead #4(-1.24m)
Bead #5(-1.74m)
Bead #6(-2.24m)
Bead #7(-2.74m)
Bead #8(-3.24m)
Bead #9(-3.74m)
Bead #10(-4.24m)
Bead #11(-4.74m)
Bead #12(-5.24m)

DYE-M Cape Dyer

Lower Site Tier II Disposal Facility (Comment by Renata Klassen, Tetra Tech EBA, March 2015)

Four vertical ground temperature cables were installed in the Lower Site Tier II Disposal Facility in 2013 (VT-1 through VT-4). The installation logs indicate that the deepest beads on VT-2 and VT-3 are located above and near the top liner elevation. The four cables have provided good quality data since installation.

Maintenance reports were not available during preparation of these comments. Downloaded data indicates that:

- Dataloggers were read on August 14, 2014.

Datalogger batteries replacement dates are missing. **New batteries should be installed within 3 years of the last battery install date.**

The air temperatures in 2014 had a thawing index of 545°C-days compared to a design mean and 1:100 year thawing index of 330°C-days and 715°C-days, respectively. Climate information was taken through correlation from Cape Dyer Upper Site weather station.

Data is insufficient to comment on temperatures in the deepest beads.

The measured maximum and minimum thaw depth in 2014 up to the data collection date was 4.2 and 2.2 m. The data collection date was not the warmest time in the year and the depth of thaw will change. The landfill has not likely reached thermal equilibrium yet. The average measured up to data collection date in 2014 thaw depth of 2.8 m was less than the design active layer of 3.9 m and the estimated 1:100 year active layer of 3.3 m, but greater than the estimated mean active layer of 2.5 m.

THERMAL MONITORING ANNUAL DATA ANALYSIS

Site: **DYE-M Cape Dyer Lower Site**
Landfill: **Borrow Area 13**

Design Infomation:

Design Active Layer (m):	0.00
Mean Active Layer (m):	0.00
1:100 Year Active Layer (m):	0.00
Mean Thawing Index (degC Days):	330.00
Mean Freezing Index (degC Days):	4110.00
1:100 Year Thawing Index (degC Days):	715.00

Maximum Active Layer (m):

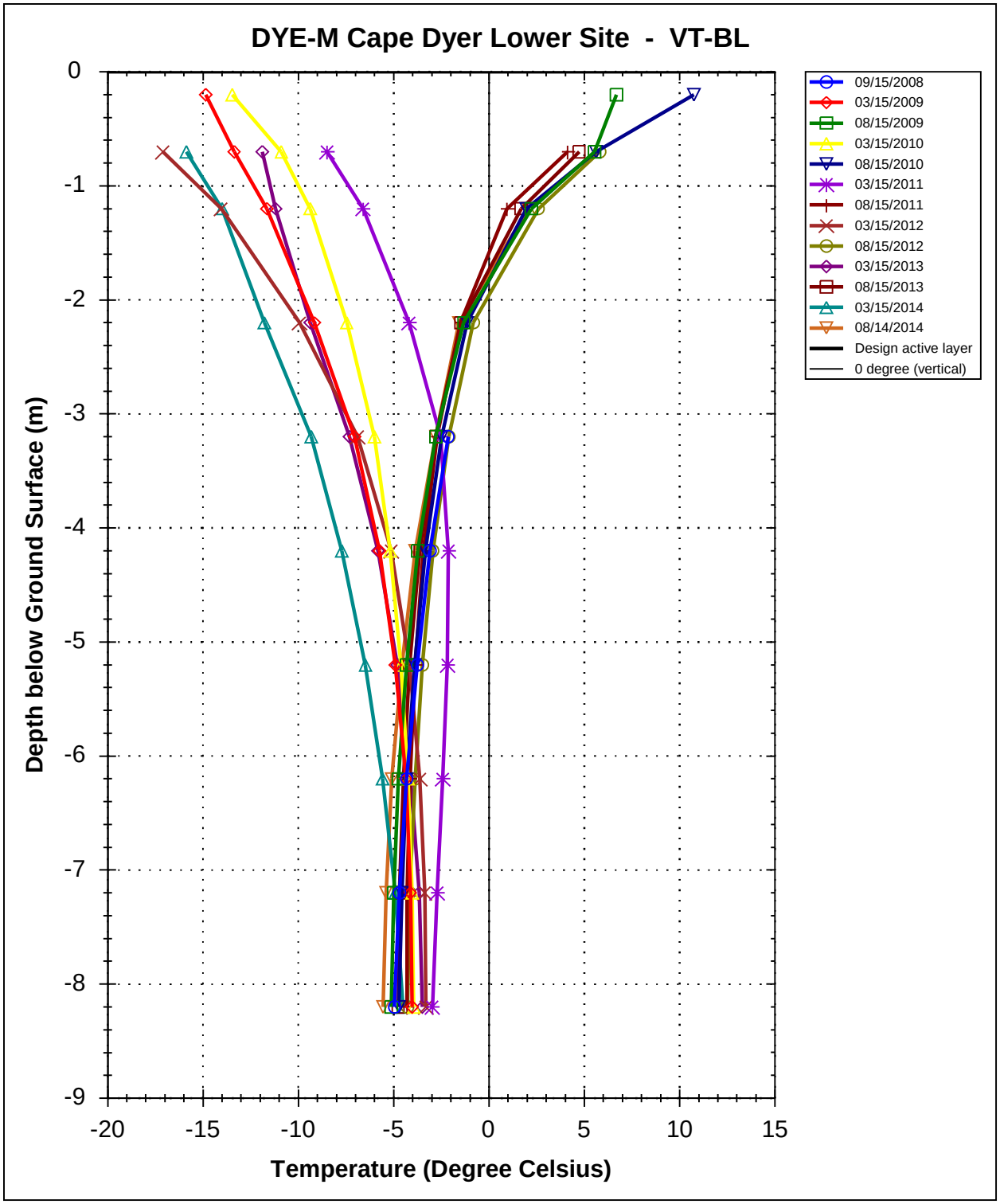
	VT-BL
2008	NaN
2009	-1.83
2010	-1.93
2011	-1.71
2012	-2.01
2013	-1.80
2014	NaN

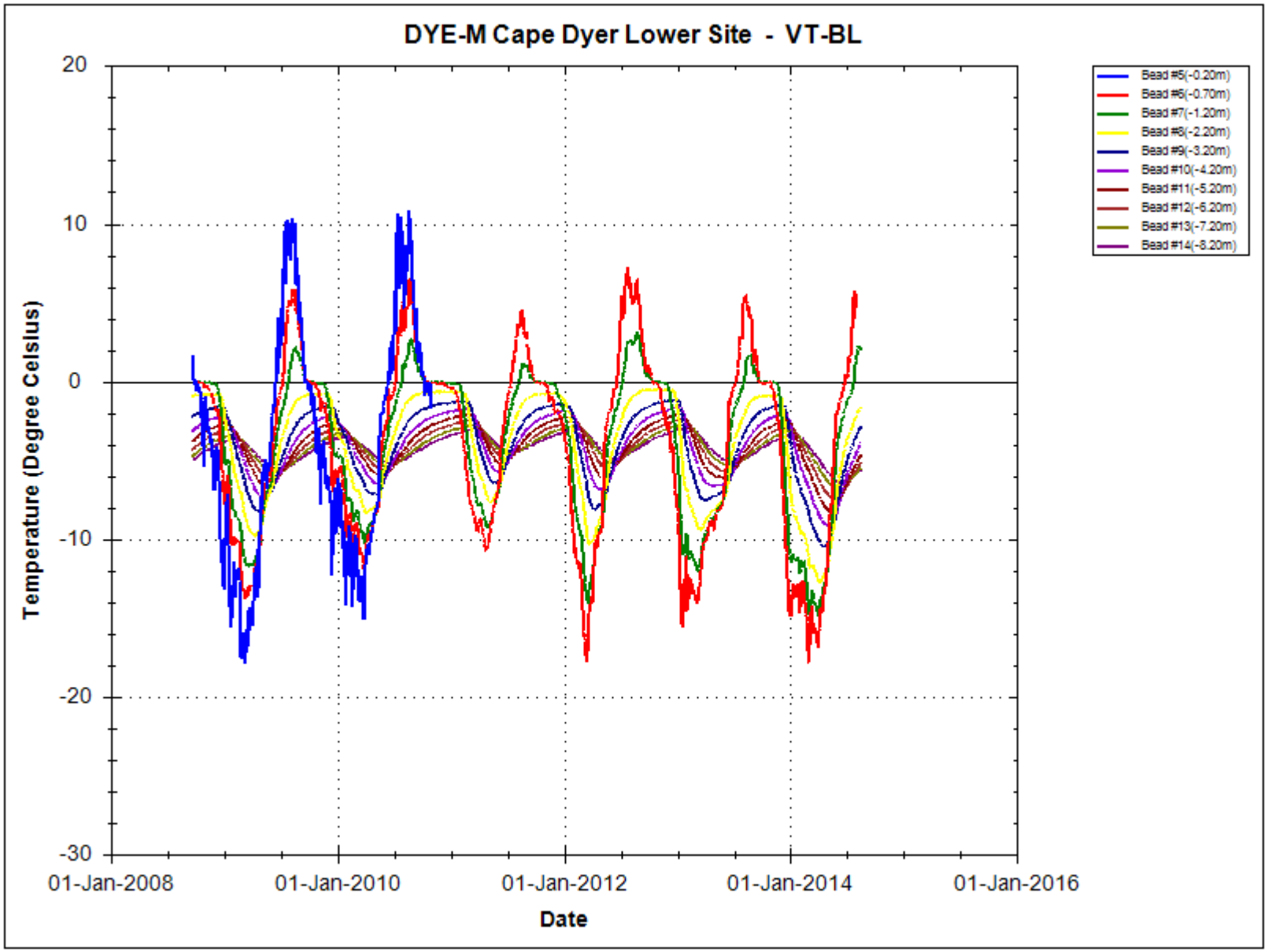
Thawing Index and Freezing Index:

	TI	FI	max AL	min AL	average AL
2008	630.00	3909.00	NaN	NaN	NaN
2009	505.00	3830.00	-1.83	-1.83	-1.83
2010	571.00	3056.00	-1.93	-1.93	-1.93
2011	460.00	NaN	-1.71	-1.71	-1.71
2012	740.00	3917.00	-2.01	-2.01	-2.01
2013	451.00	3426.00	-1.80	-1.80	-1.80
2014	545.00	3934.00	NaN	NaN	NaN

Deepest Bead Average Temperature:

	VT-BL	AVG
2008	NaN	NaN
2009	-4.49	-4.49
2010	-4.24	-4.24
2011	-3.65	-3.65
2012	-3.82	-3.82
2013	-4.06	-4.06
2014	NaN	NaN


DYE-M Cape Dyer Lower Site - VT-BL
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-20
-15
-10
-5
0
5
10
15
Temperature (Degree Celsius)
09/15/2008
03/15/2009
08/15/2009
03/15/2010
08/15/2010
03/15/2011
08/15/2011
03/15/2012
08/15/2012
03/15/2013
08/15/2013
03/15/2014
08/14/2014
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-BL
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2008
01-Jan-2010
01-Jan-2012
01-Jan-2014
01-Jan-2016
Date
Bead #5(-0.20m)
Bead #6(-0.70m)
Bead #7(-1.20m)
Bead #8(-2.20m)
Bead #9(-3.20m)
Bead #10(-4.20m)
Bead #11(-5.20m)
Bead #12(-6.20m)
Bead #13(-7.20m)
Bead #14(-8.20m)

DYE-M Cape Dyer

Lower Site Borrow Area 13 (Comment by Renata Klassen, Tetra Tech EBA, March 2015)

One vertical ground temperature cable VT-BL was installed in the native ground near the Lower Site Tier II Disposal Facility in 2008 to provide background ground temperatures for the facility. The cable has provided good quality data since installation.

Maintenance reports were not available during preparation of these comments. Downloaded data indicates that:

- Dataloggers were read on August 13, 2014.

Datalogger batteries replacement dates are missing. **New battery should be installed within 3 years of the last battery install date.**

The air temperatures in 2014 had a thawing index of 545°C-days compared to Lower Site Tier II Disposal Facility design mean and 1:100 year thawing index of 330°C-days and 715°C-days, respectively. Climate information was taken from Cape Dyer Upper Site weather station.

The thaw depth measured in 2014 was 1.8 m. The thaw depth is less than the average thaw depth of 2.8 m measured up to the data collection date in 2014 in the Lower Site Tier II Disposal Facility.

3.5 Thermistor Annual Maintenance Reports

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VAT	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07 0		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	8/14/2013		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	13.979	3.1964
	15.495	1.1706
	10.618	-0.2064
	17.122	-0.8172
	17.517	-1.2870
	17.988	-1.8177
	18.222	-2.0647
	18.483	-2.3380

Bead	ohms	Degrees C
	18.632	-2.5603
	18.754	-2.7053
	18.875	-2.8298
	19.018	-2.9596
	19.074	-3.0609

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VT2	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110052		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	8/14/2013		
Battery Levels	Main 11.34	Aux 13.63	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.508	7.1244
	11.859	6.5069
	12.972	4.6874
	14.320	2.6916
	15.724	0.8279
	16.418	-0.0597
	16.675	-0.3515
	18.42	-2.7442

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VT3	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110053		Cable Serial Number	

Master 2501 key

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date	8/14/2014	
Battery Levels	Main 11.34	Aux 13.56

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.227	7.6301
	11.917	6.4294
	12.868	4.9045
	14.144	2.9543
	15.445	1.1933
	16.413	-0.0166
	17.099	-0.7968

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name: AECOM	Inspection Date: 8/14/2014
Prepared By: Mcotteli	

Thermistor Information

Site Name: VTY	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110055		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date	8/14/2013	
Battery Levels	Main 11.34	Aux 13.50

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	11.079	7.9761
2	11.253	7.6101
3	11.805	6.6668
4	12.776	5.0367
5	13.979	3.2344
6	16.046	0.1871
7	16.951	-0.5574
8	17.452	-1.1234

Bead	ohms	Degrees C
9	17.982	-1.6996
10	18.302	-2.0879
11	18.518	-2.3277
12	18.727	-2.5603

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/14/2014
Prepared By:	Mlotecki		

Thermistor Information

Site Name:	VTSC	Thermistor Location	
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	01770053	Cable Serial Number	

Guard Brass Lock.

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☐	☑ Bead 3, 5, 6 B.d.
Battery Installation Date	8/15/2012	
Battery Levels	Main 11.34	Aux 13.38

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	8.375	12.7753
	8.461	12.5453
	12.729	-96.1851
	10.317	9.1555
	14.525	-96.1851
	12.659	-96.1851
	14.684	2.1906
	17.433	-1.4013

Bead	ohms	Degrees C
	18.753	-2.6561
	19.796	-3.7500
	20.415	-4.4234
	20.88	-4.9370
	21.11	-5.2276
	21.21	-5.4387

Observations and Proposed Maintenance

4. Crossroads Landfill

4.1 Visual Inspection

The visual inspection of the Crossroads Landfill was completed on August 11, 2014. The Crossroads Landfill is located at the Lower Camp approximately 90 m northwest of the Foundation Landfill. The approximate surface area is 1,100 m^2, based on the geophysical survey and visual assessment. The estimated landfill depth is approximately 1.5 m. The capping material of the landfill was 1.5 m Type 2 granular fill. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

4.1.1 Settlement

Occasional minor tension cracks were observed near the southwest corner on the side slope. The cracks are thought to cover less than 1% of the landfill area.

4.1.2 Erosion

There were no erosion features noted.

4.1.3 Frost Action

Frost action was not observed at the site.

4.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

4.1.5 Re-establishment of Vegetation

Sparse vegetation was noted to be growing on the landfill surface.

4.1.6 Staining

There was no staining noted during this inspection.

4.1.7 Seepage Points

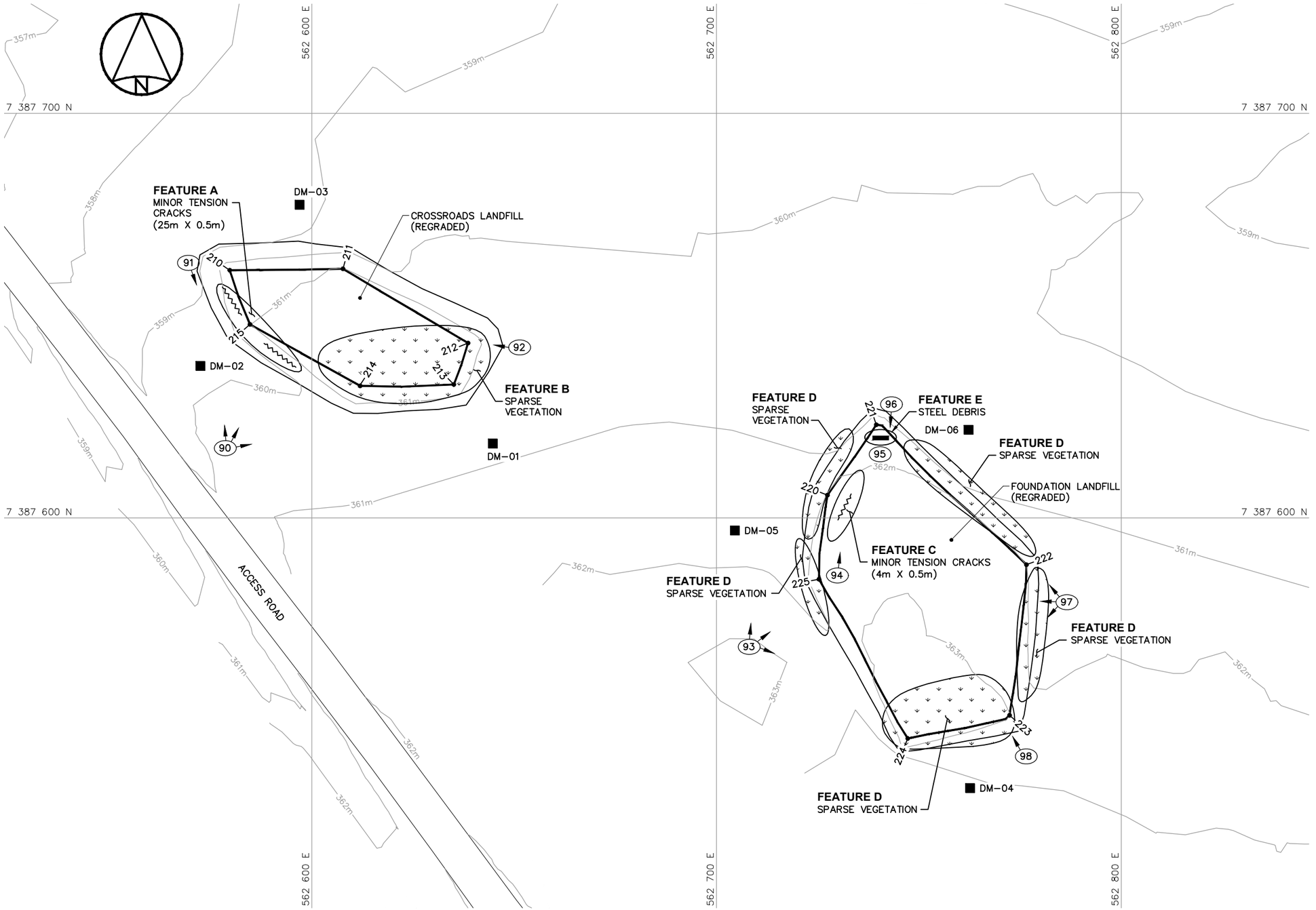
Seepage was not noted at the landfill.

4.1.8 Debris

Surface debris was not observed.

4.1.9 Discussion

As the only noted settlement was the minor tension cracks on the southwest corner, the landfill performance is considered acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (6)
- CRACKING (NTS)
- SPARSE VEGETATION
- STEEL DEBRIS (NTS)
- APPROX. PHOTOGRAPHIC VIEWPOINT

CROSSROADS LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
210	7 387 661.2	562 579.7	360.5
211	7 387 661.6	562 607.7	361.1
212	7 387 643.2	562 638.6	361.6
213	7 387 633.0	562 635.1	361.7
214	7 387 632.7	562 611.9	361.9
215	7 387 647.9	562 584.7	361.0

FOUNDATION LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
220	7 387 605.6	562 727.4	362.1
221	7 387 623.0	562 739.5	361.4
222	7 387 588.5	562 776.6	362.0
223	7 387 551.3	562 772.4	363.0
224	7 387 545.5	562 747.3	363.4
225	7 387 584.9	562 725.3	362.6

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

CROSSROADS AND FOUNDATION LANDFILLS

FIGURE DYE-M.4

AECOM

4.2 Photographic Record

Photos 90 through 92

Photograph 90. Overview of the landfill looking northeast ↑

Photograph 91. Minor tension cracks in the landfill surface ↑

Photograph 92. Looking west across the landfill ↑

4.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Crossroads Landfill
Date of Inspection:	11-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky

The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Signature:

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	Yes	Feature A - Minor tension cracks near the South West corner of the side slope	Approximately 2.5 m	Approximately 0.5 m		Less than 1%		Picture 091		Occasional	Acceptable
Animal Burrows	No									None	
Vegetation	Yes	Feature B - Occasional areas of vegetation were found on sides of landfill (refer to drawing for specific locations). Occasional individual pieces of vegetation were found on the top surface.	Areas: up to approximately 5 m Individual: up to 100 mm	Areas: up to approximately 1 m Individual: up to 100 mm	Up to 100 mm tall.	Extent of areas cover approximately 1%		Pictures 090 - 092		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	No									None	
Landfill Performance											Acceptable

DYE-M Cape Dyer
Crossroads Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

5. Foundation Landfill

5.1 Visual Inspection

The visual inspection was completed on August 11, 2014. The Foundation Landfill is located at the Lower Camp approximately 70 m north of the Powerhouse Landfill. The landfill is mounded with granular fill, and boulders have been moved to the perimeter of this area. The landfill surface area is approximately 2,500 m^2, based on the geophysical survey and visual assessment. The estimated depth of the landfill is 1.5 m. The capping material of the landfill was 0.75 m Type 2 granular fill. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

5.1.1 Settlement

Indications of settlement were not observed during the inspection.

5.1.2 Erosion

There were no erosion features observed during this inspection.

5.1.3 Frost Action

Frost action was not observed at the site.

5.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

5.1.5 Re-establishment of Vegetation

Sparse vegetation was seen on the landfill surface.

5.1.6 Staining

There was no staining noted during this inspection.

5.1.7 Seepage Points

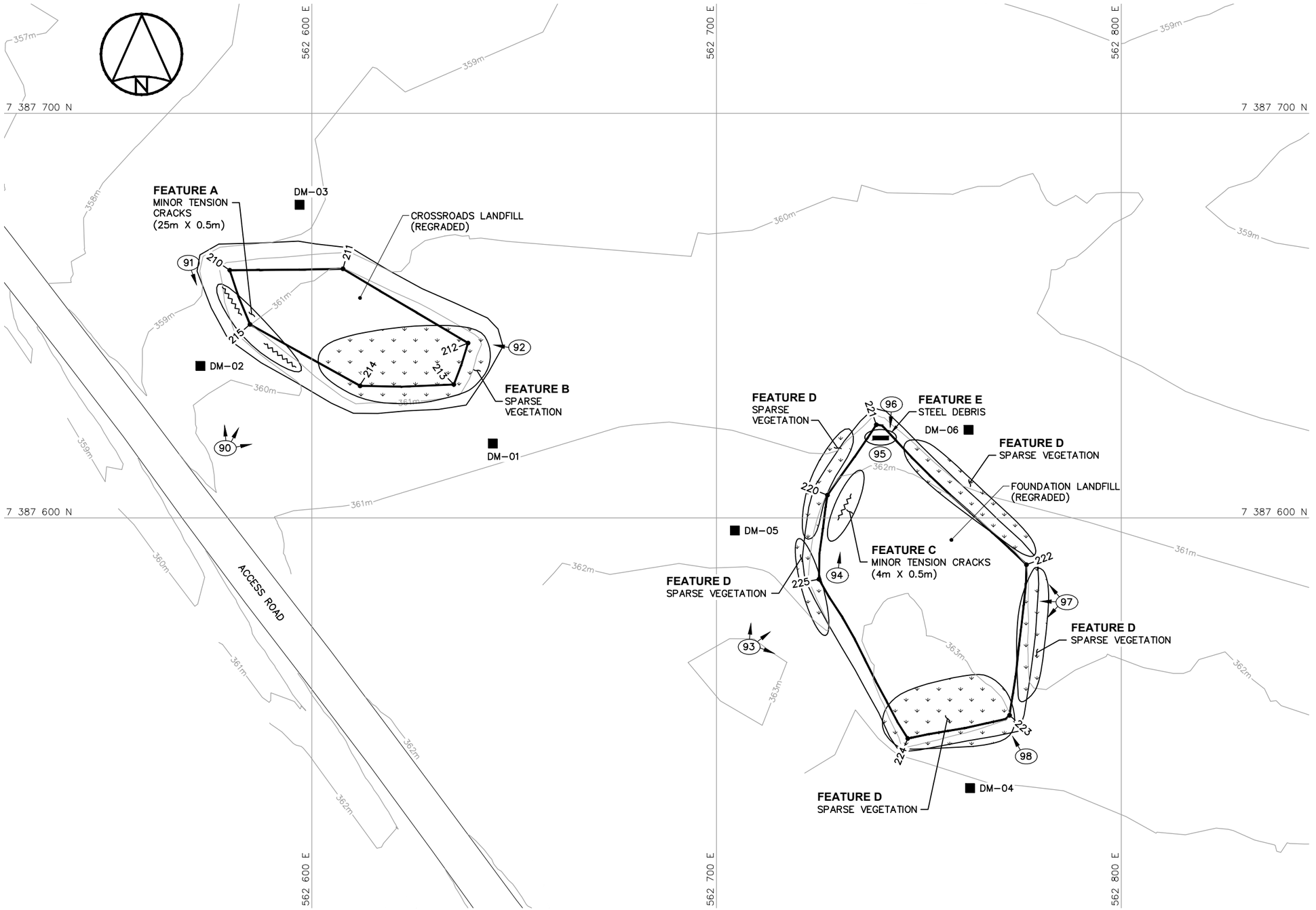
Seepage was not noted at the landfill.

5.1.8 Debris

An exposed piece of steel debris was observed in the granular material and is thought to have been brought in when the fill was being placed rather than originating from within the landfill.

5.1.9 Discussion

There was no evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (6)
- CRACKING (NTS)
- SPARSE VEGETATION
- STEEL DEBRIS (NTS)
- APPROX. PHOTOGRAPHIC VIEWPOINT

CROSSROADS LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
210	7 387 661.2	562 579.7	360.5
211	7 387 661.6	562 607.7	361.1
212	7 387 643.2	562 638.6	361.6
213	7 387 633.0	562 635.1	361.7
214	7 387 632.7	562 611.9	361.9
215	7 387 647.9	562 584.7	361.0

FOUNDATION LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
220	7 387 605.6	562 727.4	362.1
221	7 387 623.0	562 739.5	361.4
222	7 387 588.5	562 776.6	362.0
223	7 387 551.3	562 772.4	363.0
224	7 387 545.5	562 747.3	363.4
225	7 387 584.9	562 725.3	362.6

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

CROSSROADS AND FOUNDATION LANDFILLS

FIGURE DYE-M.4

AECOM

5.2 Photographic Record

Photos 93 through 98

Photograph 93. Overview of the landfill looking east ↑

Photograph 94. Minor cracking on the surface of the landfill ↑

Photograph 95. Debris in capping material ↑

Photograph 96. Overview of the landfill looking south ↑

Photograph 97. Overview of the landfill looking west ↑

Photograph 98. Overview of the landfill looking north ↑

5.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Foundation Landfill
Date of Inspection:	11-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	Yes	Feature C - Minor tension cracks along the West edge of the regrade on the side slope	Approximately 4 m	Approximately 0.5 m		Less than 1%		Picture 094		Occasional	Acceptable
Animal Burrows	No									None	
Vegetation	Yes	Feature D - Occasional areas of vegetation were found on sides of landfill (refer to drawing for specific locations). Occasional individual pieces of vegetation were found on the top surface	Areas: up to approximately 15 m Individual: up to 100 mm	Areas: up to approximately 2.5 m Individual: up to 100 mm	Up to 100 mm tall	Extent of areas cover approximately 1%	See photographs.	Pictures 093, 094, 096, 097, 098		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Feature E - One piece of steel exposed at North corner of top surface.						Pictures 095, 096		Isolated	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	No									None	
Landfill Performance											Acceptable

DYE-M Cape Dyer
Foundation Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

6. Powerhouse Landfill

6.1 Visual Inspection

The Powerhouse Landfill visual inspection was completed on August 12, 2104. The Powerhouse Landfill is located at the Lower Camp approximately 140 m northwest of the former powerhouse and is bounded on the west and east sides by access roads. The landfill area was formerly the location of an Inuit construction camp. The area of this landfill is approximately 3,400 m^2, based on a geophysical surveys and visual assessment. The estimated depth of the landfill is greater than 1.5 m. The top surface of the landfill is 2.4 m of Type 2 granular fill with 0.75 m Type 1 armouring rock on the sides. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

6.1.1 Settlement

Indications of settlement were not observed during the inspection.

6.1.2 Erosion

There were no erosion features observed during this inspection.

6.1.3 Frost Action

Frost action was not observed at the site.

6.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

6.1.5 Re-establishment of Vegetation

Occasional individual plants were seen on the landfill surface.

6.1.6 Staining

There was no staining noted during this inspection.

6.1.7 Seepage Points

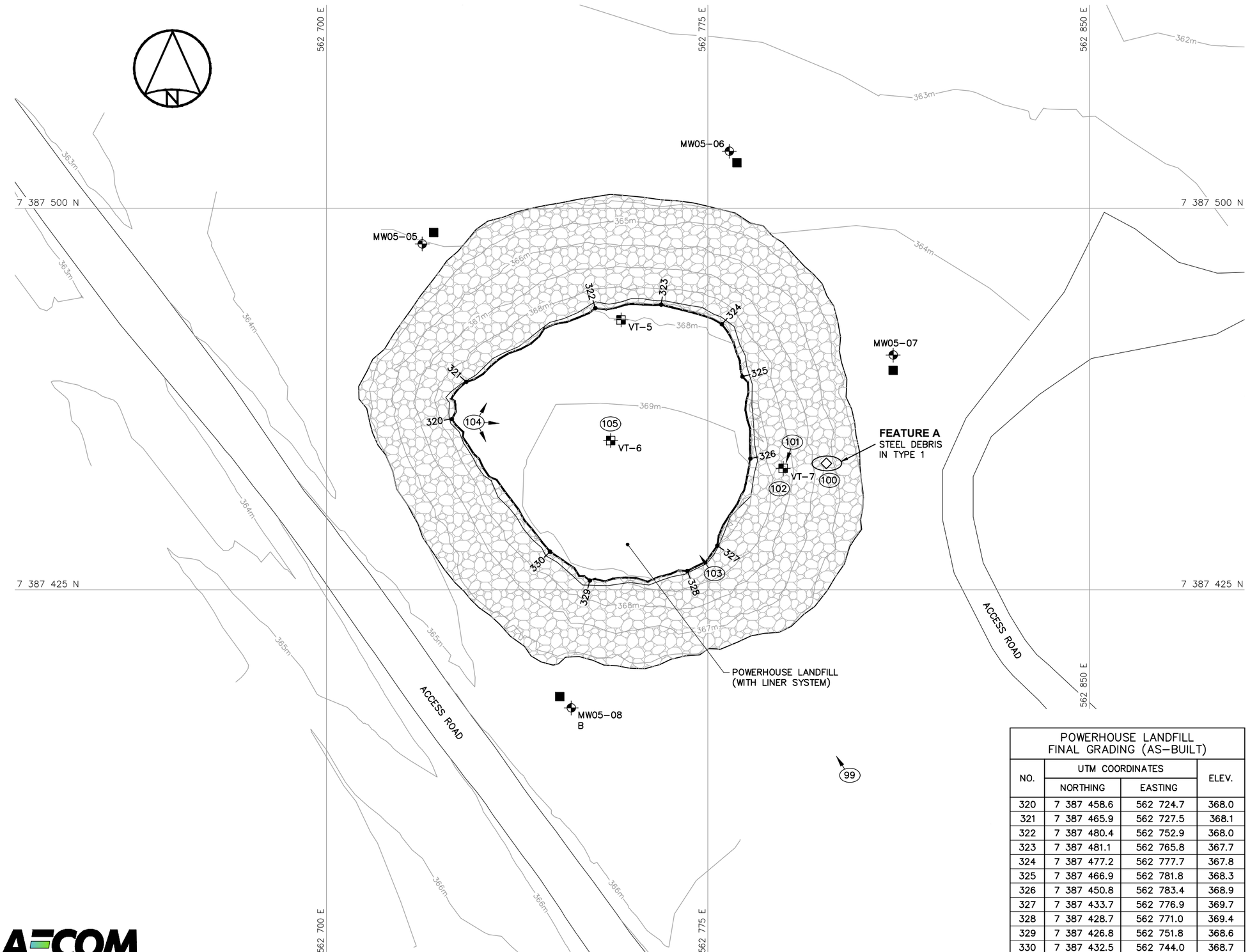
Seepage was not noted at the landfill.

6.1.8 Debris

One piece of steel was exposed in the Type 1 armouring on the side slopes of the landfill. This debris was likely placed with the fill material during construction.

6.1.9 Discussion

As there was minimal evidence of settlement, the landfill performance is rated as acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 320 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (3)
- MONITORING SOIL SAMPLE LOCATION (4)
- STEEL DEBRIS (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

POWERHOUSE LANDFILL MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-05	7 387 493.0	562 718.8	364.1
MW05-06	7 387 511.2	562 779.2	363.7
MW05-07	7 387 471.1	562 811.4	364.5
MW05-08	7 387 401.8	562 748.1	365.5

POWERHOUSE LANDFILL GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-5	7 387 478.1	562 757.9	368.0
VT-6	7 387 454.4	562 755.9	369.5
VT-7	7 387 448.9	562 789.8	*367.6

*NOTE:
ELEVATION IS TO FINAL GRADE OF TYPE 2 GRANULAR FILL PRIOR TO PLACEMENT OF TYPE 1 GRANULAR FILL.

POWERHOUSE LANDFILL FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
320	7 387 458.6	562 724.7	368.0
321	7 387 465.9	562 727.5	368.1
322	7 387 480.4	562 752.9	368.0
323	7 387 481.1	562 765.8	367.7
324	7 387 477.2	562 777.7	367.8
325	7 387 466.9	562 781.8	368.3
326	7 387 450.8	562 783.4	368.9
327	7 387 433.7	562 776.9	369.7
328	7 387 428.7	562 771.0	369.4
329	7 387 426.8	562 751.8	368.6
330	7 387 432.5	562 744.0	368.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

POWERHOUSE LANDFILL

FIGURE DYE-M.5

AECOM

6.2 Photographic Record

Photos 99 through 105

Photograph 99. Overview of the landfill looking northwest ↑

Photograph 100. Debris in Type 1 granular fill ↑

Photograph 101. **VT-7 ↑**

Photograph 102. Inside the casing for VT-7 ↑

Photograph 103. Overview of the landfill looking northwest ↑

Photograph 104. Overview of the landfill looking east ↑

Photograph 105. VT-6 ↑

6.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Powerhouse Landfill
Date of Inspection:	12-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found on the top surface	Individual: up to 100 mm	Individual: up to 100 mm	Up to 100 mm tall	Extent of areas cover less than 1%		Picture103		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Feature A - One piece of steel exposed East of VT-7	Individual: up to 100 mm	Individual: up to 100 mm	Up to 100 mm tall	Extent of areas cover less than 1%		Picture 100		None	
Presence/Condition - Monitoring Instruments	Yes							Pictures 101, 102, 103, 105			
Features of Note	No									None	
Landfill Performance											Acceptable

DYE-M Cape Dyer
Powerhouse Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	Acceptable	

6.4 Thermistor Data

THERMAL MONITORING ANNUAL DATA ANALYSIS

Site: **DYE-M Cape Dyer Lower Site**
Landfill: **Powerhouse Landfill**

Design Infomation:

Design Active Layer (m):	-3.90
Mean Active Layer (m):	-2.50
1:100 Year Active Layer (m):	-3.30
Mean Thawing Index (degC Days):	330.00
Mean Freezing Index (degC Days):	4110.00
1:100 Year Thawing Index (degC Days):	715.00

Maximum Active Layer (m):

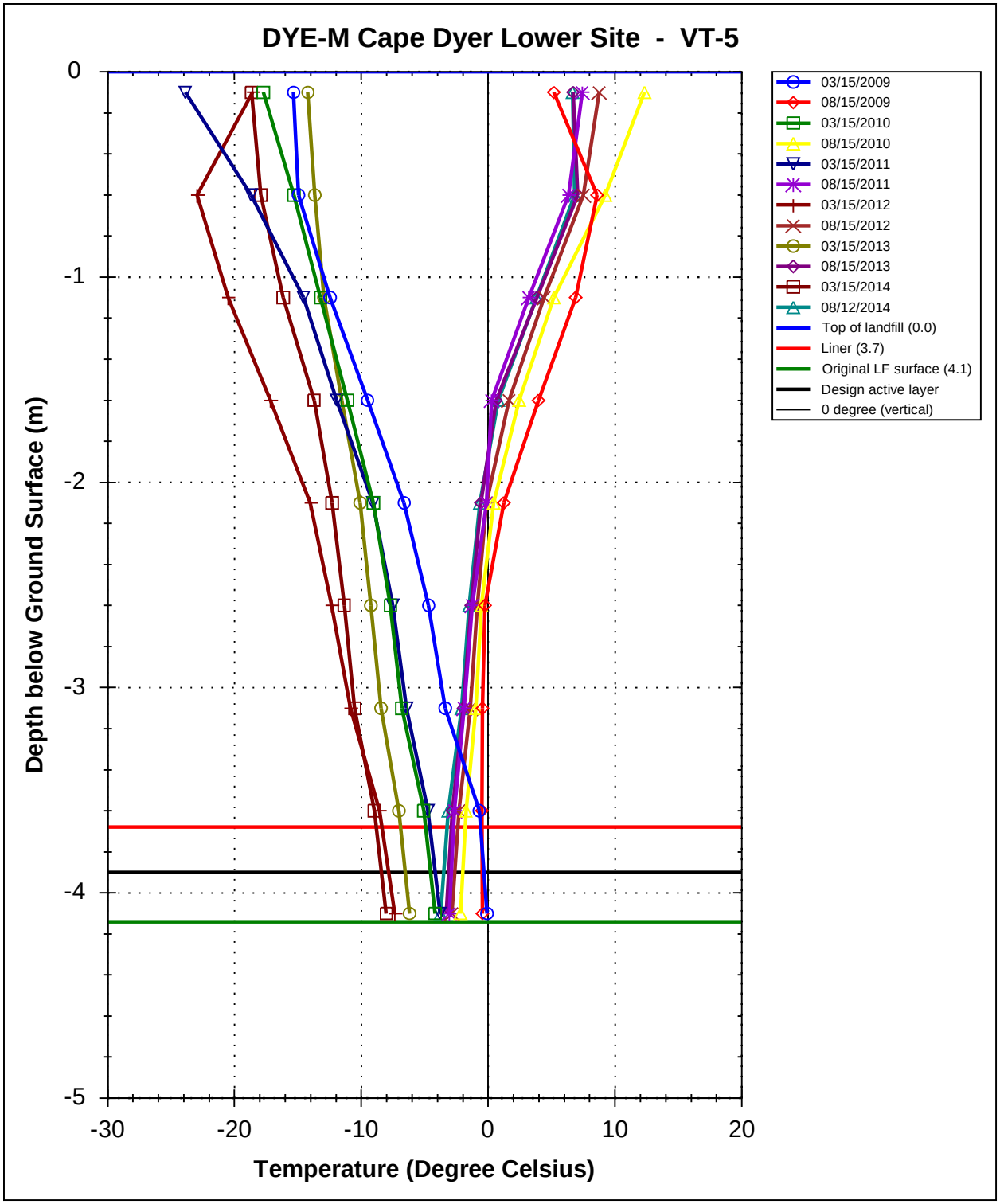
	VT-5	VT-6	VT-7
2008	NaN	NaN	NaN
2009	-2.63	-2.50	NaN
2010	-2.47	-2.31	-3.04
2011	-2.10	-1.84	-2.39
2012	-2.13	-2.14	-2.84
2013	-1.95	-1.84	-1.40
2014	NaN	NaN	NaN

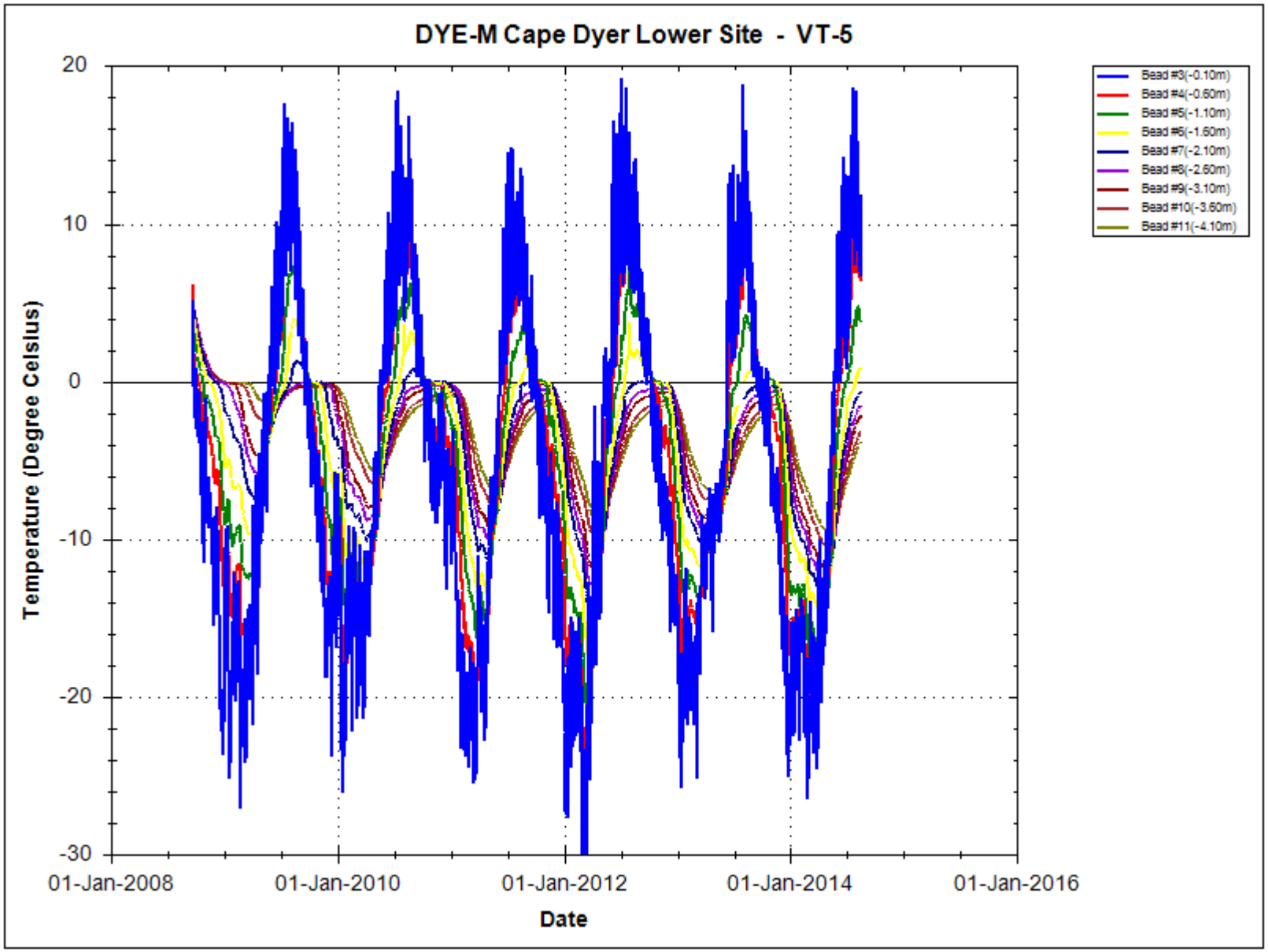
Thawing Index and Freezing Index:

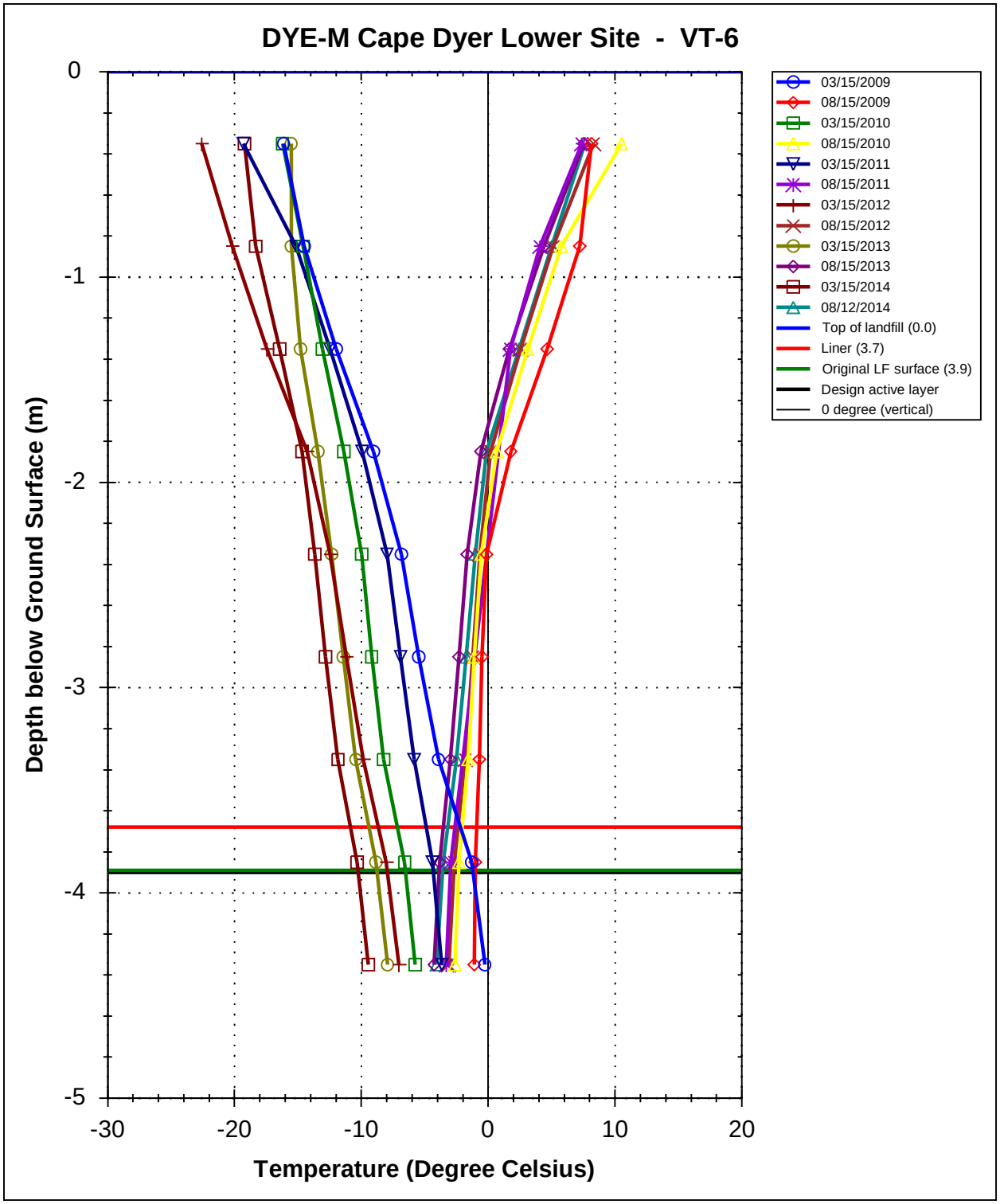
	TI	FI	max AL	min AL	average AL
2008	630.00	3909.00	NaN	NaN	NaN
2009	505.00	3830.00	-2.63	-2.50	-2.57
2010	571.00	3056.00	-3.04	-2.31	-2.61
2011	460.00	NaN	-2.39	-1.84	-2.11
2012	740.00	3917.00	-2.84	-2.13	-2.37
2013	451.00	3426.00	-1.95	-1.40	-1.73
2014	545.00	3934.00	NaN	NaN	NaN

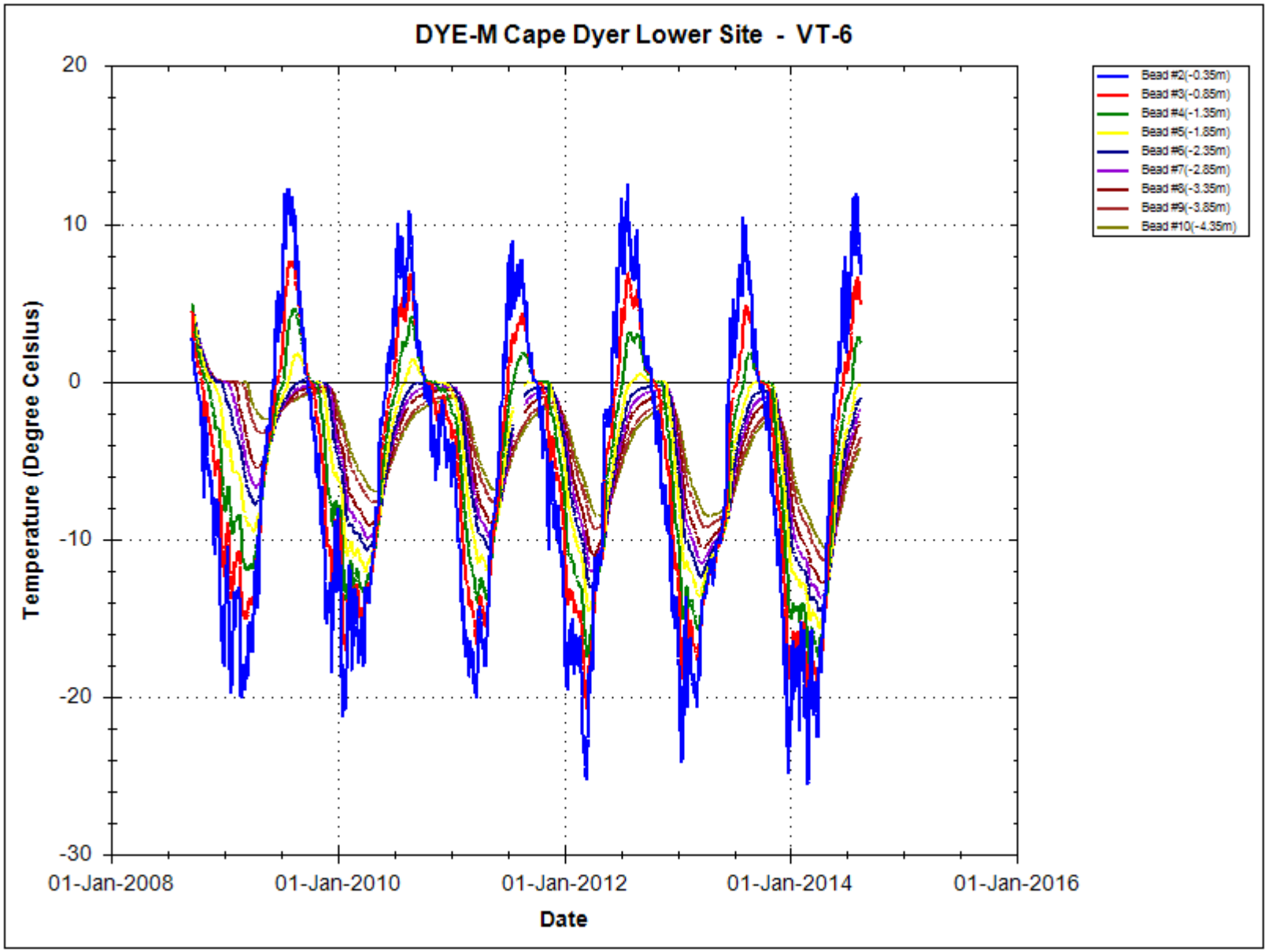
Deepest Bead Average Temperature:

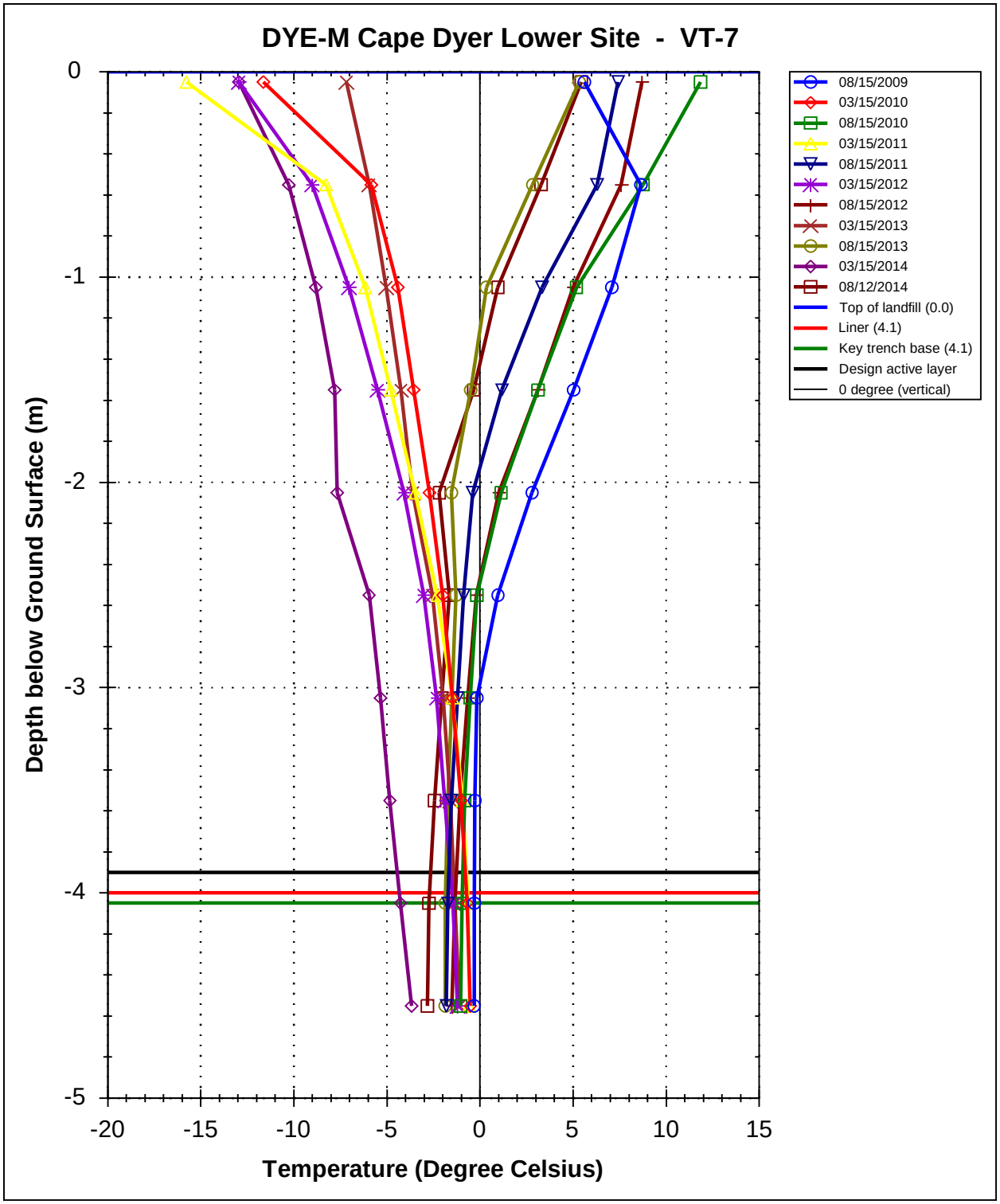
	VT-5	VT-6	VT-7	AVG
2008	NaN	NaN	NaN	NaN
2009	-0.44	-1.04	NaN	-0.74
2010	-2.81	-3.67	-0.83	-2.44
2011	-3.28	-3.40	-1.40	-2.69
2012	-4.34	-4.46	-1.49	-3.43
2013	-4.10	-5.33	-1.52	-3.65
2014	NaN	NaN	NaN	NaN

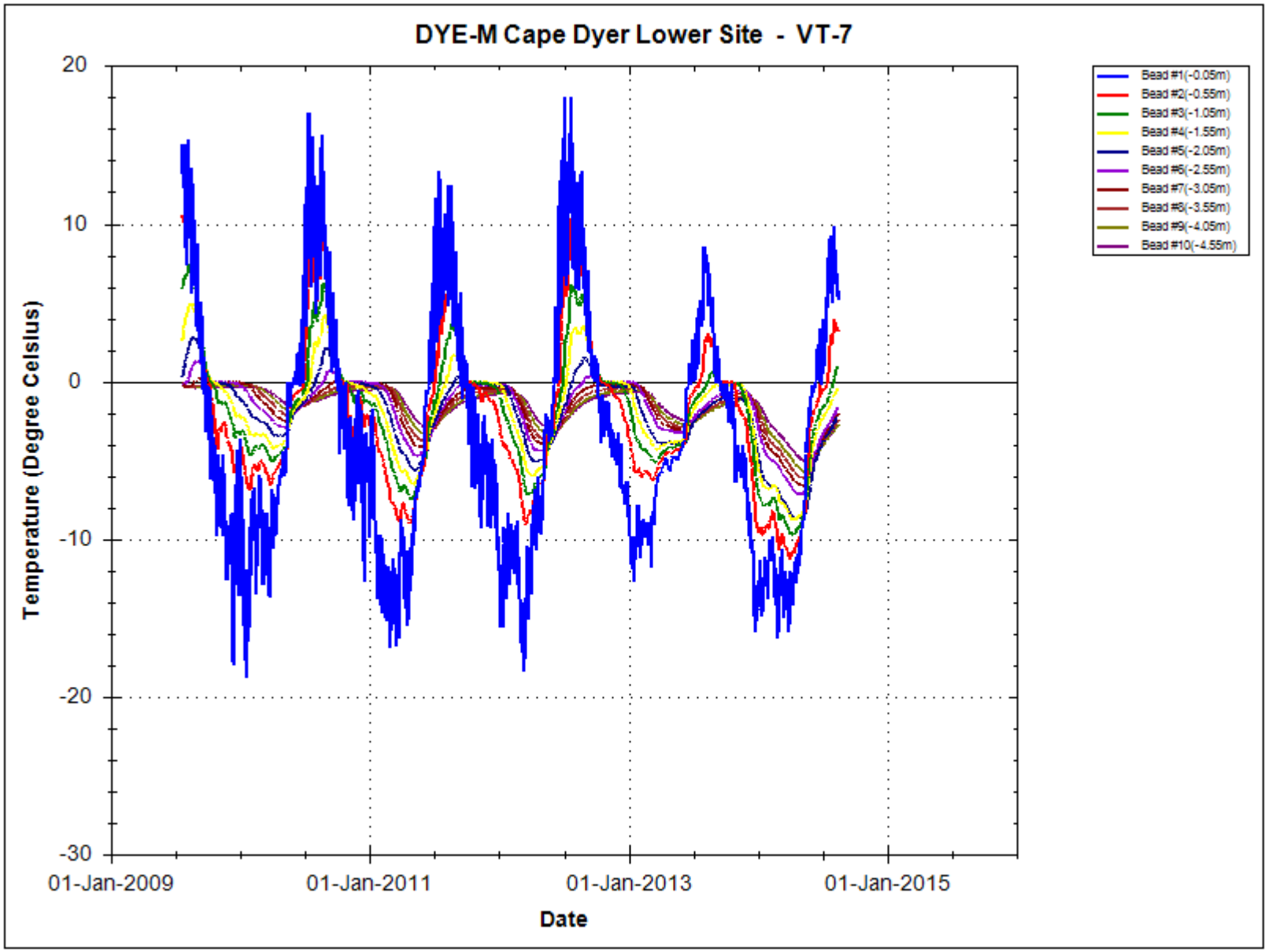

DYE-M Cape Dyer Lower Site - VT-5
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-30
-20
-10
0
10
20
Temperature (Degree Celsius)
03/15/2009
08/15/2009
03/15/2010
08/15/2010
03/15/2011
08/15/2011
03/15/2012
08/15/2012
03/15/2013
08/15/2013
03/15/2014
08/12/2014
Top of landfill (0.0)
Liner (3.7)
Original LF surface (4.1)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-5
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2008
01-Jan-2010
01-Jan-2012
01-Jan-2014
01-Jan-2016
Date
Bead #3(-0.10m)
Bead #4(-0.60m)
Bead #5(-1.10m)
Bead #6(-1.60m)
Bead #7(-2.10m)
Bead #8(-2.60m)
Bead #9(-3.10m)
Bead #10(-3.60m)
Bead #11(-4.10m)


DYE-M Cape Dyer Lower Site - VT-6
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-30
-20
-10
0
10
20
03/15/2009
08/15/2009
03/15/2010
08/15/2010
03/15/2011
08/15/2011
03/15/2012
08/15/2012
03/15/2013
08/15/2013
03/15/2014
08/12/2014
Top of landfill (0.0)
Liner (3.7)
Original LF surface (3.9)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-6
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2008
01-Jan-2010
01-Jan-2012
01-Jan-2014
01-Jan-2016
Date
Bead #2(-0.35m)
Bead #3(-0.85m)
Bead #4(-1.35m)
Bead #5(-1.85m)
Bead #6(-2.35m)
Bead #7(-2.85m)
Bead #8(-3.35m)
Bead #9(-3.85m)
Bead #10(-4.35m)


DYE-M Cape Dyer Lower Site - VT-7
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-20
-15
-10
-5
0
5
10
15
08/15/2009
03/15/2010
08/15/2010
03/15/2011
08/15/2011
03/15/2012
08/15/2012
03/15/2013
08/15/2013
03/15/2014
08/12/2014
Top of landfill (0.0)
Liner (4.1)
Key trench base (4.1)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Lower Site - VT-7
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2009
01-Jan-2011
01-Jan-2013
01-Jan-2015
Date
Bead #1(-0.05m)
Bead #2(-0.55m)
Bead #3(-1.05m)
Bead #4(-1.55m)
Bead #5(-2.05m)
Bead #6(-2.55m)
Bead #7(-3.05m)
Bead #8(-3.55m)
Bead #9(-4.05m)
Bead #10(-4.55m)

DYE-M Cape Dyer

Powerhouse Landfill (Comment by Renata Klassen, Tetra Tech EBA, March 2015)

Three vertical ground temperature cables are installed in the Powerhouse Landfill that was constructed in 2008 (VT-5 and VT-6 in 2008, and VT-7 in 2009). VT-5 is located near the landfill slope and VT-6 on top of the landfill. VT-7 is located on the landfill slope and reaches 0.5 m below the key trench base. The three cables continue providing good quality data since installation.

Maintenance reports were not available during preparation of these comments. Downloaded data indicates that:

- Dataloggers were read on August 12, 2014.

Datalogger batteries replacement dates are missing. **New batteries should be installed within 3 years of the last battery install date.**

The air temperatures in 2013 had a thawing index of 451°C-days compared to a design mean and 1:100 year thawing index of 330°C-days and 715°C-days, respectively. Climate information was taken through correlation from Cape Dyer Upper Site weather station.

The mean deepest bead average annual temperature was -3.7°C in 2013. The mean deepest bead average annual temperature cooled by an average of 0.2°C between 2012 and 2013. The mean deepest bead average annual temperature has been cooling since 2010. The three deepest beads on VT-7 have been in a frozen state since installation in 2009.

The measured maximum and minimum active layer in 2013 was 2.0 m and 1.4 m. The average measured active layer reduced from 2.4 m to 1.7 m between 2012 and 2013. The average active layer of 1.7 m in 2013 was less than the design active layer of 3.9 m, the estimated 1:100 year active layer of 3.3 m and the estimated mean active layer of 2.5 m.

The landfill is performing as expected from a thermal perspective.

6.5 Thermistor Annual Maintenance Reports

Thermistor Annual Maintenance Report

Contractor Name:	AECOM.	Inspection Date:	8/12/2014
Prepared By:	Mlotecki.		

Thermistor Information

Site Name:		Thermistor Location	VT5
Thermistor Number:	VT5	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110024	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	Clamp was loose. → tightened.
Beads	☑	☐	
Battery Installation Date	8/9/2012		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	9.150	9.2765
	11.453	8.9312
	12.996	8.1342
	14.499	6.4694
	16.360	3.9513
	17.050	1.0270
	17.663	-0.4735
	18.357	-1.3689

Bead	ohms	Degrees C
	19.365	-2.0081
	19.818	-3.0609
	19.79	-3.7264

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/12/2014
Prepared By:	

Thermistor Information

Site Name:	Thermistor Location	VT 6	
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)		Nodal Points
Datalogger Serial # 0711	25		Cable Serial Number

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☐	☐	Top cable bead.
Battery Installation Date	8-9-2012		
Battery Levels	Main 11.34	Aux 13.50	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	9.166	138.6296
	8.602	7.0143
	9.248	5.0143
	11.798	2.5569
	13.024	-0.166
	15.519	-0.8656
	16.725	-1.5765
	17.515	-2.3277

Bead	ohms	Degrees C
	18.076	-3.3918
	19.092	-3.9179

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/12/2014
Prepared By:	M Lotecki		

Thermistor Information

Site Name:	Powerhouse CF	Thermistor Location	V1.9
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110026	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	~~2015~~ 8/9/2012		
Battery Levels	Main 11.34V	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	11.857	5.4883
2	13.879	3.3293
3	15.520	1.0925
4	16.575	-0.2169
5	18.101	-2.0879
6	17.598	-1.5098
7	17.937	-1.9026
8	18.400	-2.3768

Bead	ohms	Degrees C
9	18.631	-2.6224
10	18.132	-2.7468

Observations and Proposed Maintenance

7. Lower Site Non-Hazardous Waste Landfill

7.1 Visual Inspection

The Lower Site Non-Hazardous Waste Landfill visual inspection was completed on August 18, 2014. The landfill is located southeast of the hangar in the former lower site camp area. The capping material of the landfill was 1.0 m Type 2 granular fill. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

7.1.1 Settlement

Indications of settlement were not observed during the inspection.

7.1.2 Erosion

There were no erosion features observed during this inspection.

7.1.3 Frost Action

Frost action was not observed at the site.

7.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

7.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

7.1.6 Staining

There was no staining noted during this inspection.

7.1.7 Seepage Points

Seepage was not noted at the landfill.

7.1.8 Debris

Surface debris was not observed.

7.1.9 Discussion

Tire tracks and a rough area were observed on the surface of the landfill. There was no evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable.

562 950 E
563 075 E
563 200 E
7 387 050 N
7 386 925 N
AIRSTRIP APRON
AIRSTRIP
MW05-09
MW05-12
MW09-28
MW09-27
MW09-26
B
LOWER SITE
NON-HAZARDOUS
WASTE LANDFILL
FEATURE A
VARIOUS MISC.
TIRE TRACKS
FEATURE B
ROUGH AREA
FEATURE C
VARIOUS MISC.
TIRE TRACKS
1.5%
360
361
362
363
364
365
366
134
135
136
137
138
139
140
141

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 360 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- APPROXIMATE LOCATION OF COMMEMORATIVE PLAQUE
- MONITORING SOIL SAMPLE LOCATION (5)
- ROUGH AREA
- TIRE TRACKS (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

LOWER SITE NON-HAZARDOUS WASTE LANDFILL MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-09	7 387 070.2	563 034.5	372.6
MW05-12	7 387 075.3	563 106.6	371.7
MW09-26	7 386 910.8	563 062.9	373.8
MW09-27	7 386 963.5	562 926.1	373.0
MW09-28	7 387 018.0	562 933.5	373.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

LOWER SITE NON-HAZARDOUS WASTE LANDFILL FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
360	7 386 987.6	562 924.7	375.2
361	7 387 026.8	562 989.0	375.8
362	7 387 069.9	563 061.7	375.0
363	7 386 943.1	563 141.7	377.0
364	7 386 949.1	563 079.3	377.5
365	7 386 937.1	563 044.8	377.7
366	7 386 912.0	562 972.9	376.5

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE NON - HAZARDOUS WASTE LANDFILL

FIGURE DYE-M.6

AECOM

7.2 Photographic Record

Photos 134 through 141

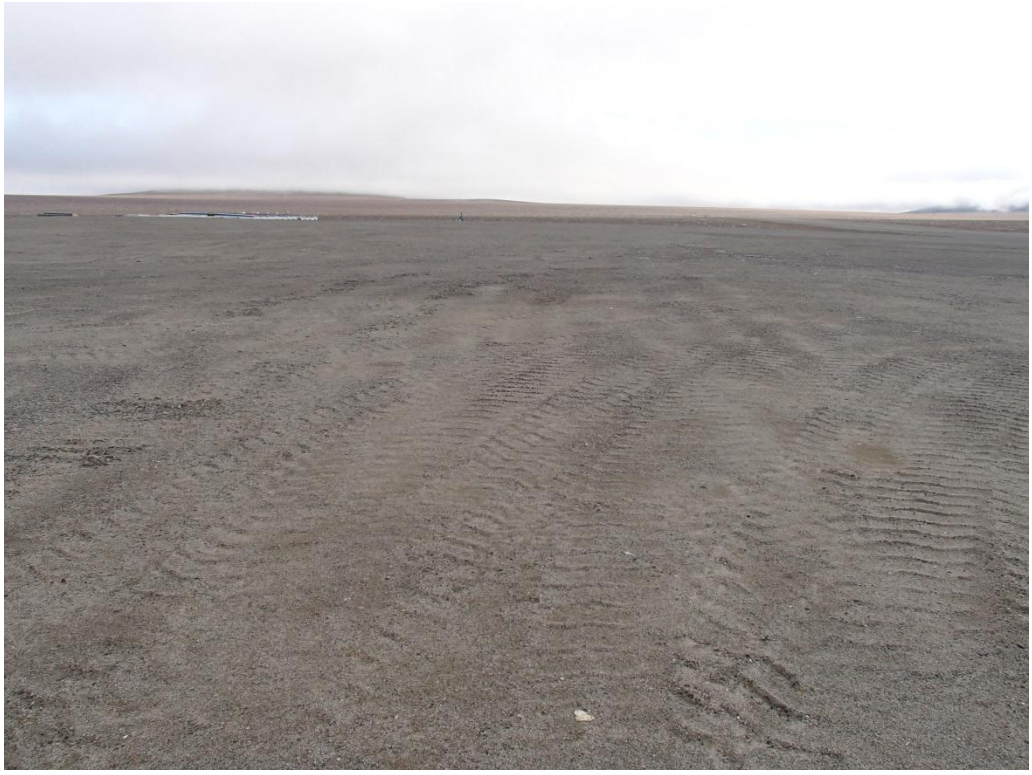
Photograph 134. Overview of the landfill from the northwest corner ↑

Photograph 135. Rough area in the centre of the landfill ↑

Photograph 136. Centre of the landfill looking southwest ↑

Photograph 137. Centre of the landfill looking southeast ↑

Photograph 138. Centre of the landfill looking northeast ↑



Photograph 139. Rough area in the centre of the landfill ↑

Photograph 140. Commemorative plaque at the toe of the landfill ↑

Photograph 141. The southeast corner of the landfill looking west ↑

7.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Lower Site Non - Hazardous Waste Landfill
Date of Inspection:	18-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky

The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Signature: 

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Feature A - Tire tracks observed on surface of landfill Feature B - Rough area noted in centre of facility Feature C - tire tracks at the southeast corner	A - Approx. 5 m B - Approx. 45 m C - Approx. 7 m	A - Approx. 0.3 m B - Approx. 25 m C - Approx. 0.2 m	A - Approx. 0.02 m B - N/a C - Approx. 0.03 m	Less than 10%.		A - photo 138 B - photo 139 C - photo 141		Occasional	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Lower Site Non - Hazardous Waste Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

8. Upper Site Tier II Disposal Facility

8.1 Visual Inspection

The Upper Site Tier II Disposal Facility visual inspection was completed on August 13, 2014. The landfill is located along the main access road from the middle site to the upper site. The capping material of the landfill was 3.2 m Type 2 granular fill for the top cover, with Type 1 armouring rocks on the side slopes. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

8.1.1 Settlement

Indications of settlement were not observed during the inspection.

8.1.2 Erosion

There were no erosion features observed during this inspection.

8.1.3 Frost Action

Frost action was not observed at the site.

8.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

8.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

8.1.6 Staining

There was no staining noted during this inspection.

8.1.7 Seepage Points

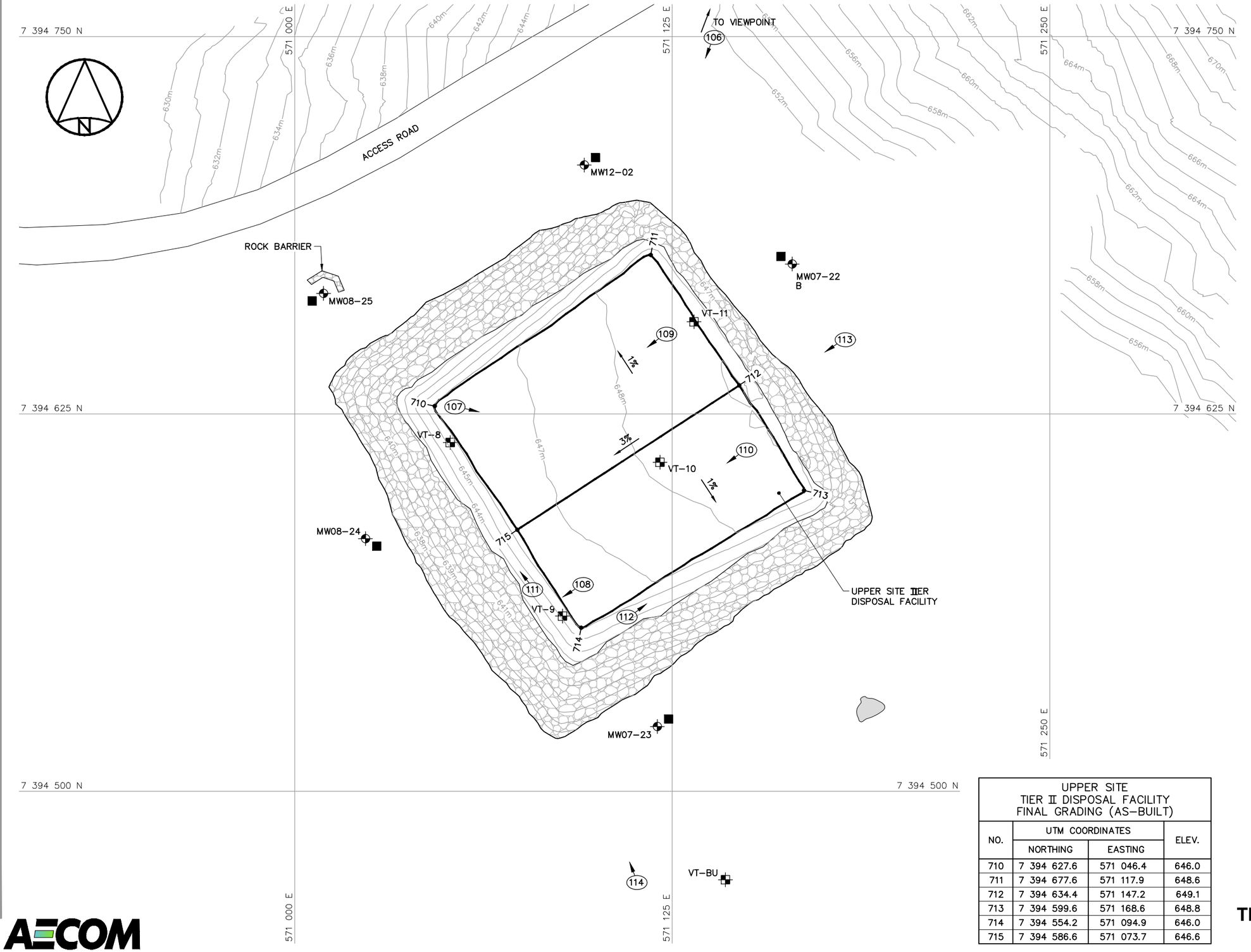
Seepage was not noted at the landfill.

8.1.8 Debris

Surface debris was not observed.

8.1.9 Discussion

Tire tracks and some segregation of fill materials were observed on the surface of the landfill. Segregation occurs when the fine soils from stockpiled granular fill material are separated from the coarser material. The finished surface consists of areas of only coarse material at the surface. Areas of segregation are more susceptible to a loose surface. There was no evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 710 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (5)
- MONITORING SOIL SAMPLE LOCATION (5)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

UPPER SITE
TIER II DISPOSAL FACILITY
MONITORING WELLS (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW07–22	7 394 674.6	571 164.7	648.5
MW07–23	7 394 521.5	571 120.1	638.2
MW08–24	7 394 583.7	571 023.4	636.1
MW08–25	7 394 664.9	571 009.6	635.1
MW12–02	7 394 707.4	571 095.9	642.3

UPPER SITE
TIER II DISPOSAL FACILITY
GROUND TEMPERATURE CABLES (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT–8	7 394 615.5	571 051.5	645.4
VT–9	7 394 558.0	571 088.7	645.5
VT–10	7 394 609.0	571 121.0	648.2
VT–11	7 394 655.5	571 132.2	648.9
VT–BU	7 394 470.7	571 142.6	636.9

UPPER SITE
TIER II DISPOSAL FACILITY
FINAL GRADING (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
710	7 394 627.6	571 046.4	646.0
711	7 394 677.6	571 117.9	648.6
712	7 394 634.4	571 147.2	649.1
713	7 394 599.6	571 168.6	648.8
714	7 394 554.2	571 094.9	646.0
715	7 394 586.6	571 073.7	646.6

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12,5 25 m SCALE 1:1250

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE
TIER II DISPOSAL FACILITY

FIGURE DYE-M.7

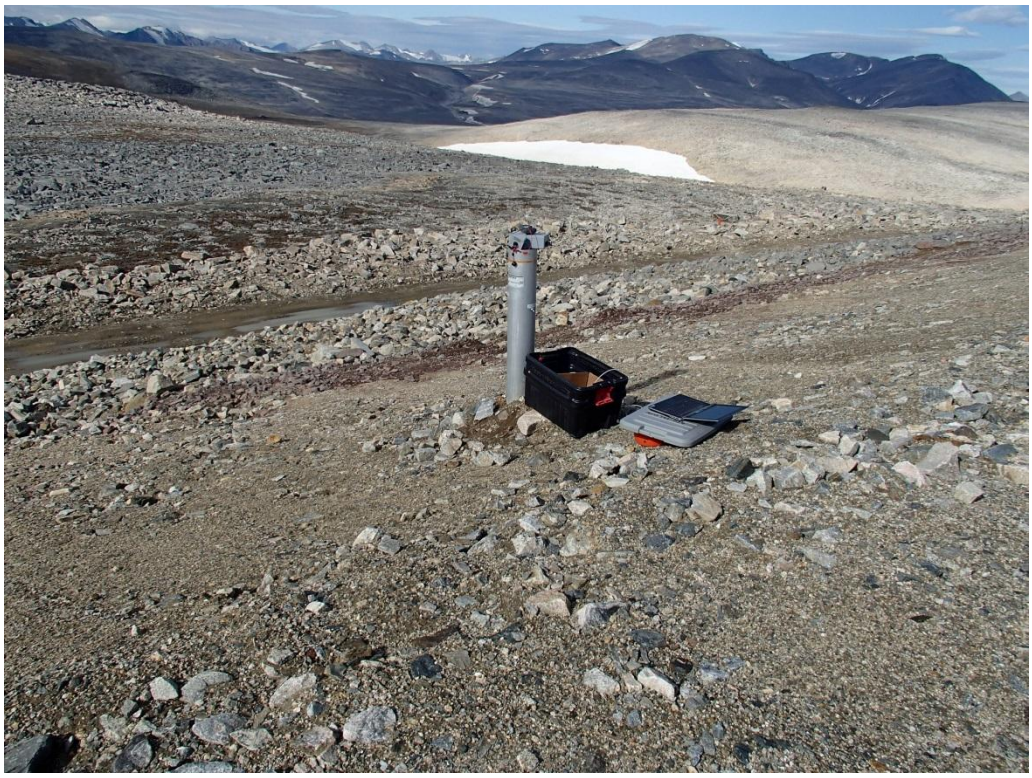
AECOM

8.2 Photographic Record

Photos 106 through 114

Photograph 106. Overview of US Tier II Landfill ↑

Photograph 107. West corner looking across the landfill ↑



Photograph 108. VT-9 ↑

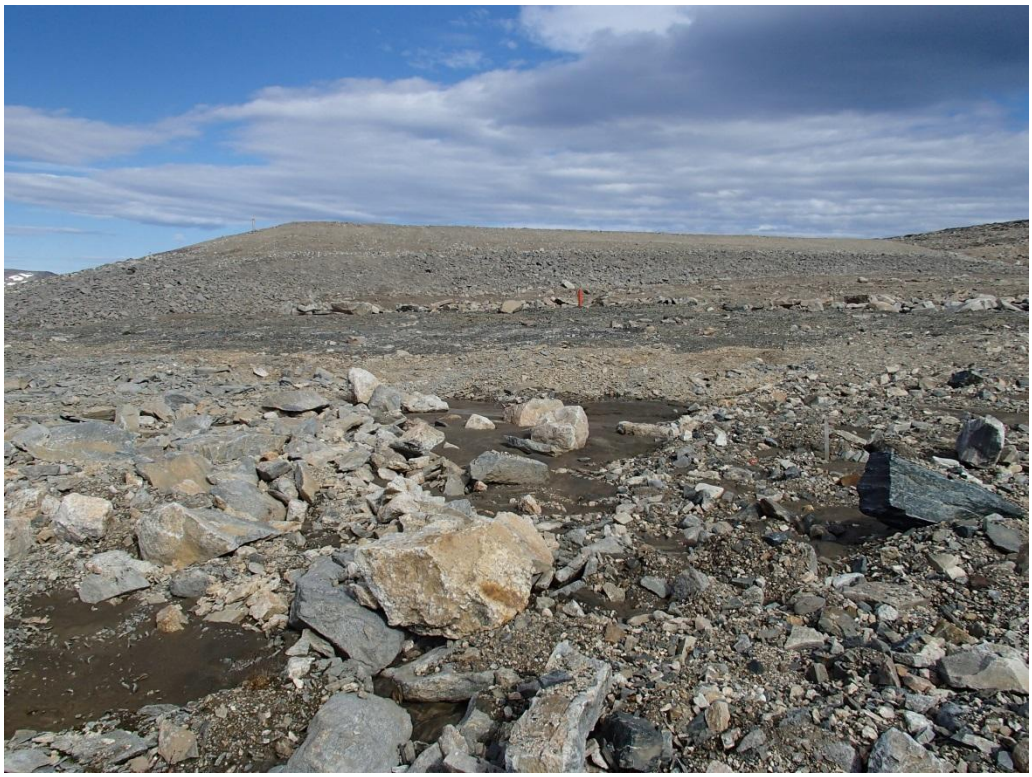
Photograph 109. East side of the landfill looking west. North half↑

Photograph 110. **East side of the landfill looking west. South half ↑**

Photograph 111. **South corner looking northwest ↑**

Photograph 112. South corner looking northeast ↑

Photograph 113. Northeast side of the landfill ↑



Photograph 114. South corner of the landfill ↑

8.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Upper Site Non - Tier II Disposal Facility
Date of Inspection:	13-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	Yes							Pictures 107, 108, 110, 113, 114			
Features of Note	Yes	Tire tracks observed on surface of landfill. Areas of segregation observed on surface of landfill				Less than 50%.		Pictures 029 - 037		Numerous	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Upper Site Non - Tier II Disposal Facility
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

8.4 Thermistor Data – Tier II Facility and Background Thermistor (Borrow Area 2)

THERMAL MONITORING ANNUAL DATA ANALYSIS

Site: **DYE-M Cape Dyer Upper Site**
Landfill: **Upper Site Tier II Disposal Facility**

Design Infomation:

Design Active Layer (m):	-3.20
Mean Active Layer (m):	-1.80
1:100 Year Active Layer (m):	-2.40
Mean Thawing Index (degC Days):	175.00
Mean Freezing Index (degC Days):	4220.00
1:100 Year Thawing Index (degC Days):	535.00

Maximum Active Layer (m):

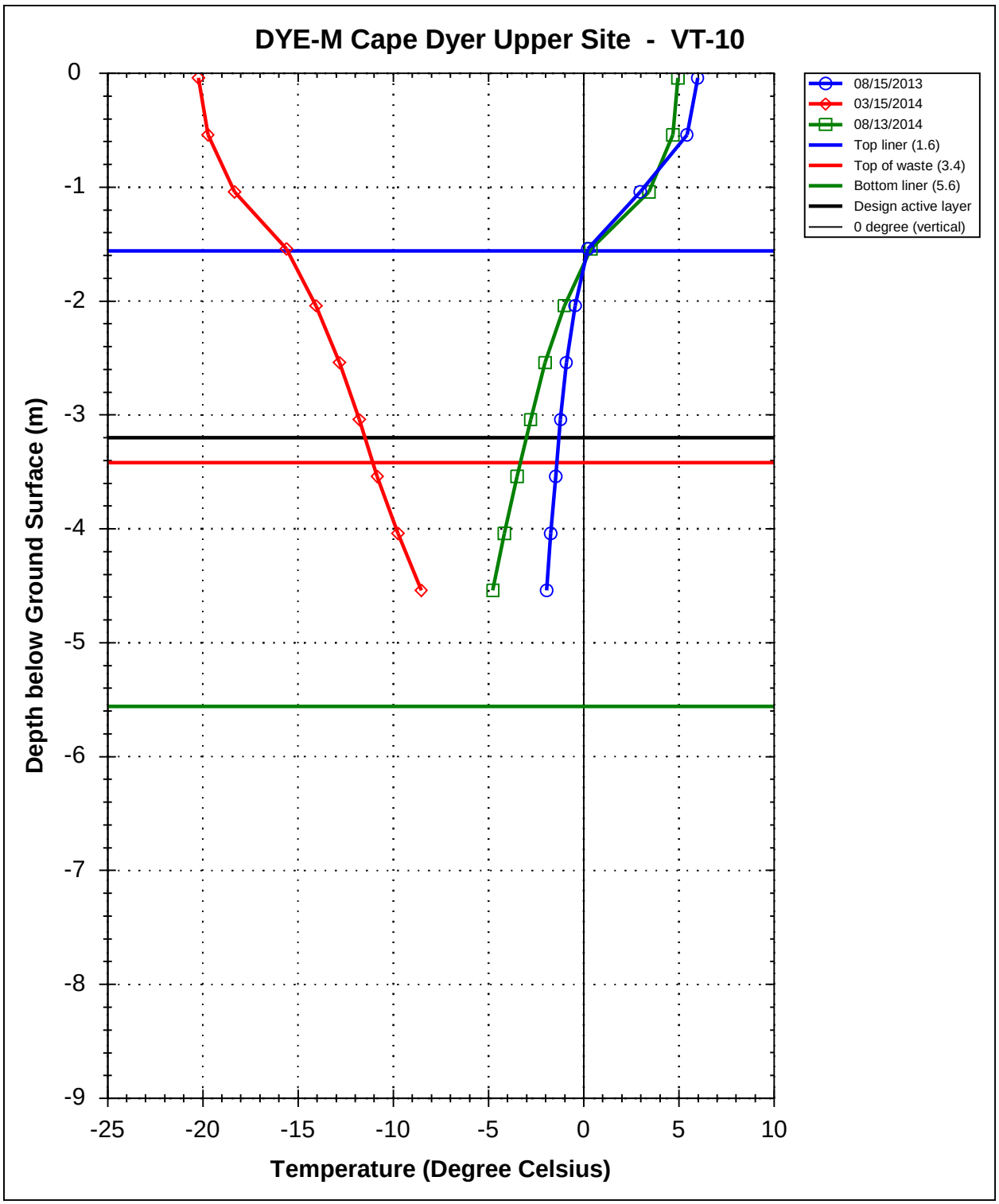
	VT-10	VT-11	VT-8	VT-9
2013	NaN	NaN	NaN	NaN
2014	-1.67	-1.92	-1.85	-2.05

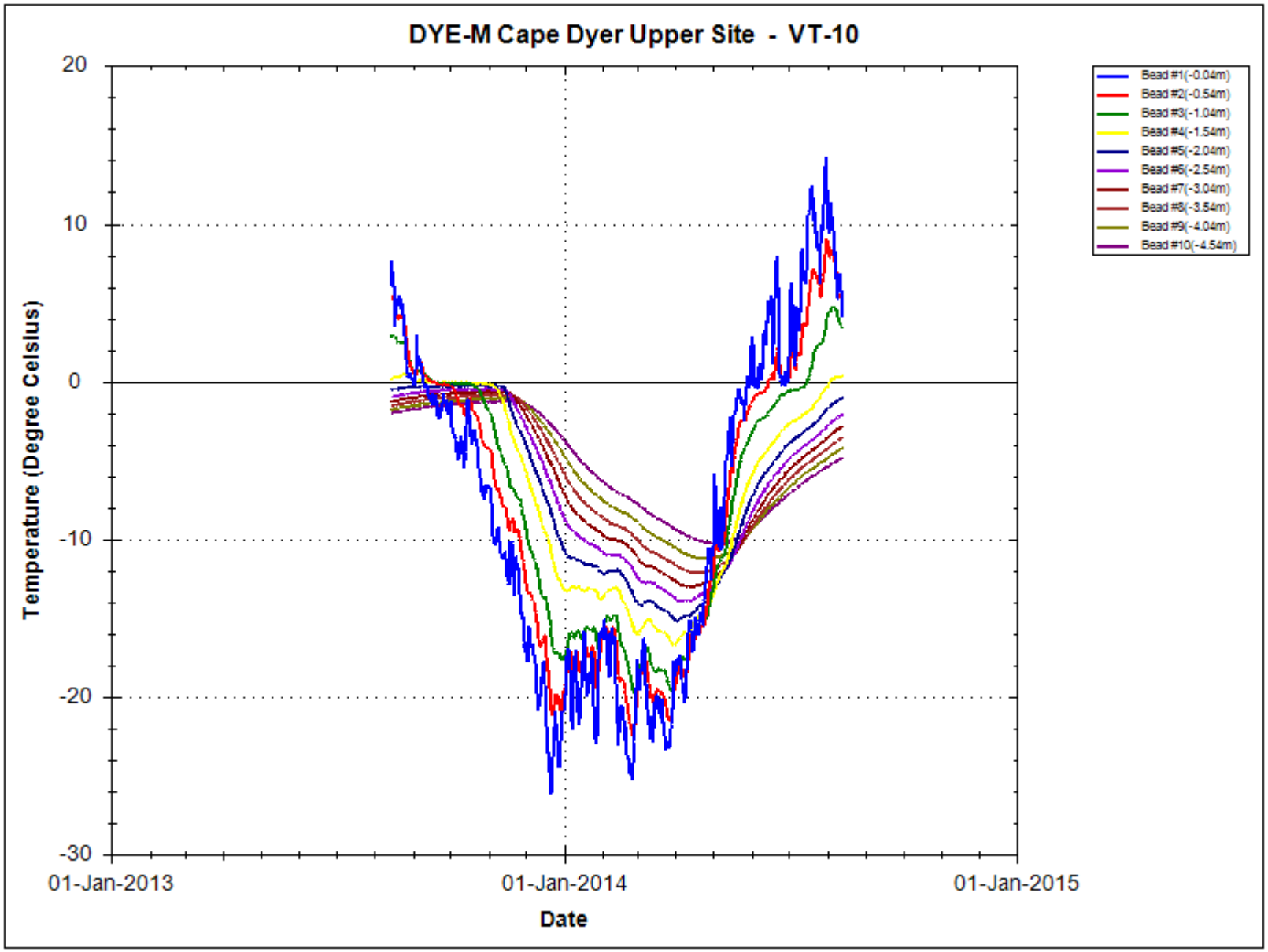
Thawing Index and Freezing Index:

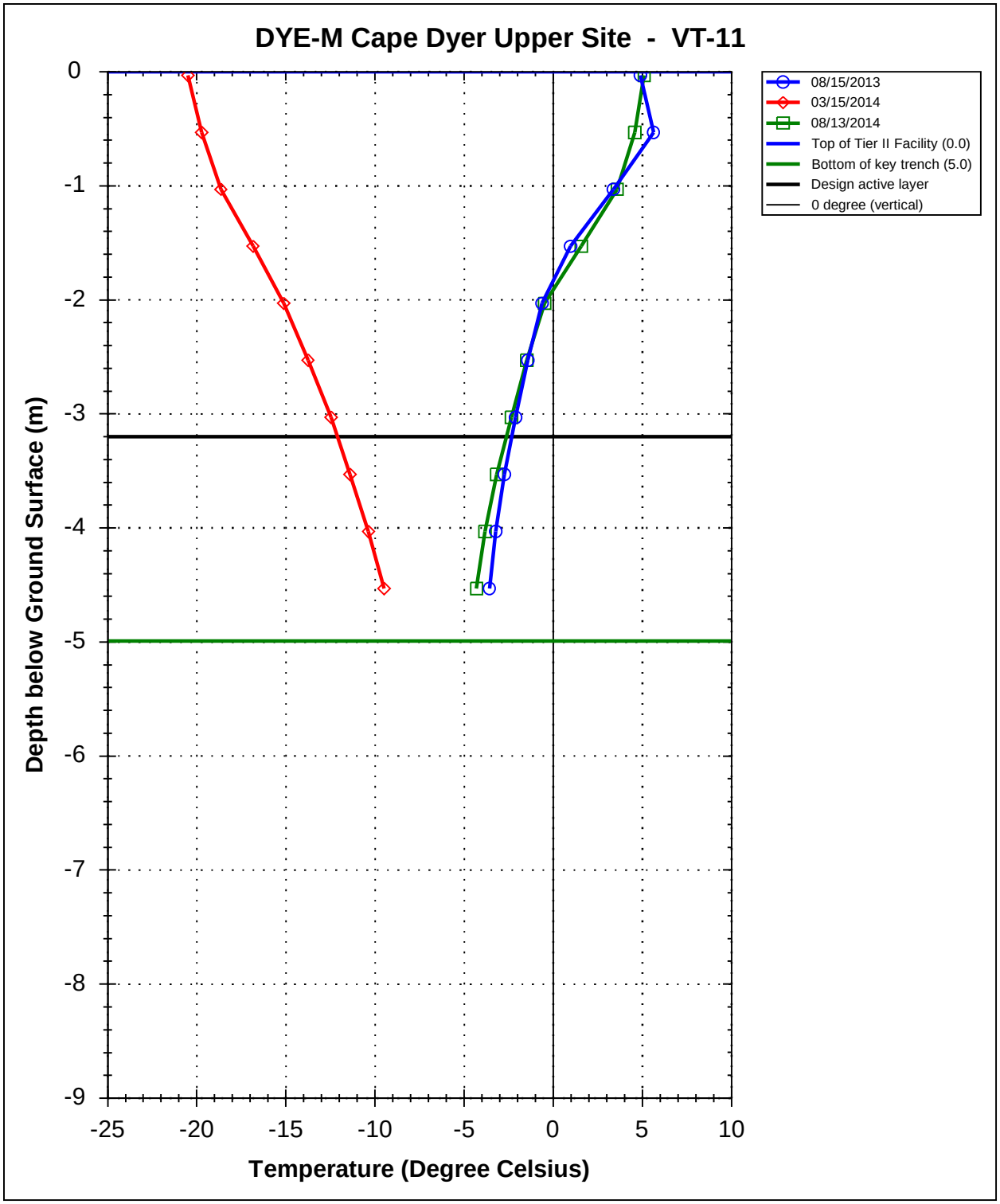
	TI	FI	max AL	min AL	average AL
2013	257.00	3502.00	NaN	NaN	NaN
2014	353.00	4012.00	-2.05	-1.67	-1.87

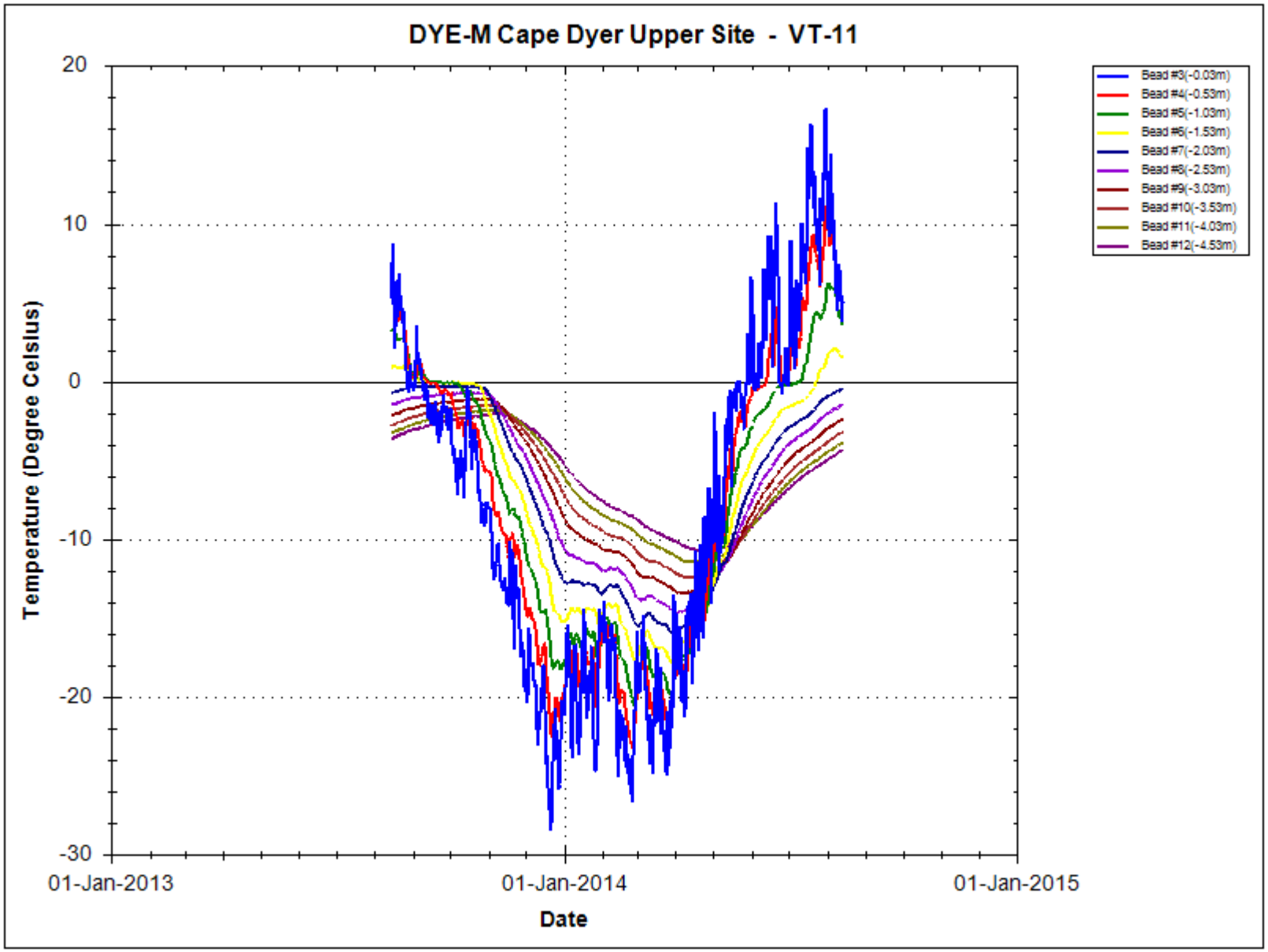
Deepest Bead Average Temperature:

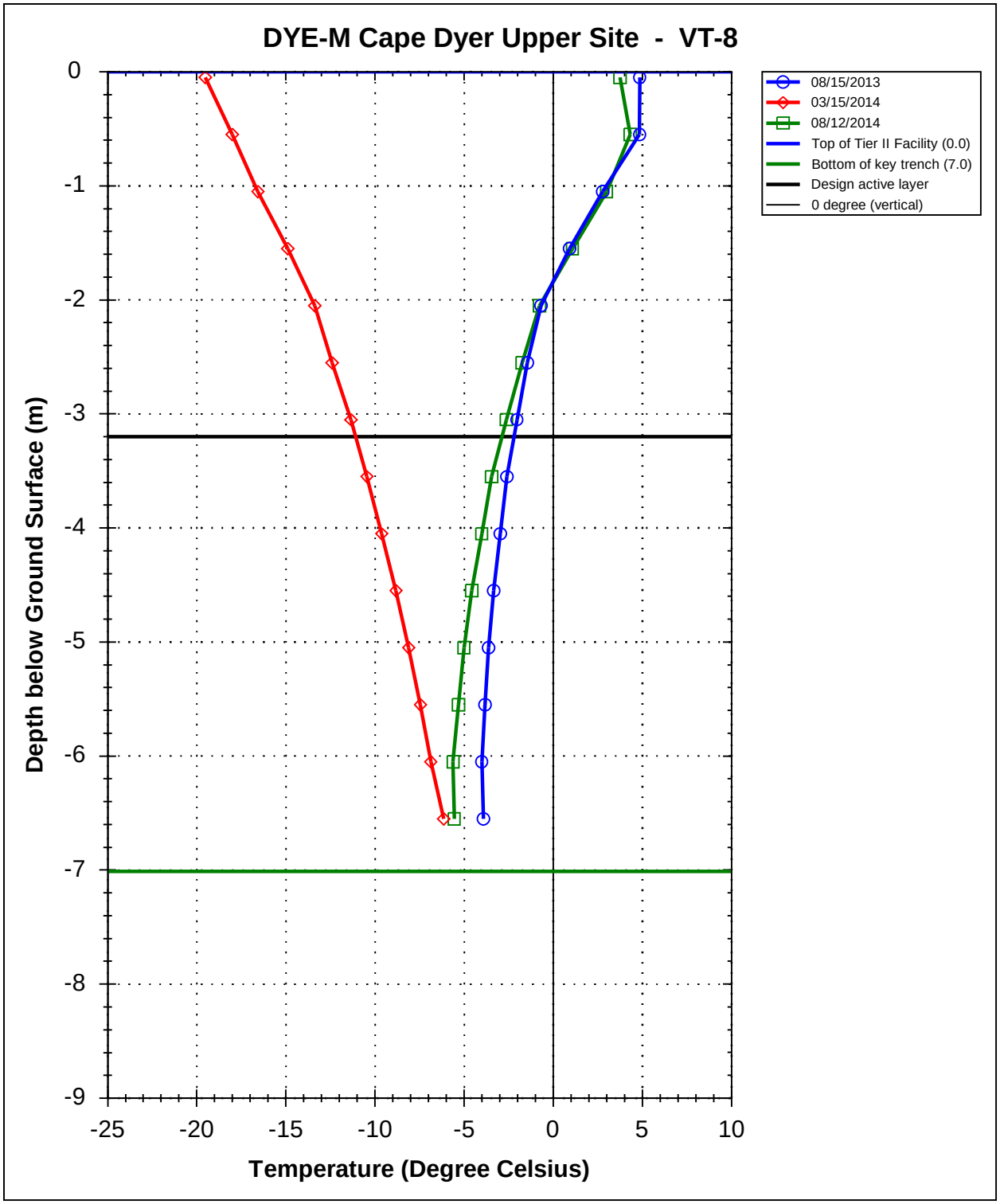
	VT-10	VT-11	VT-8	VT-9	AVG
2013	NaN	NaN	NaN	NaN	NaN
2014	NaN	NaN	NaN	NaN	NaN

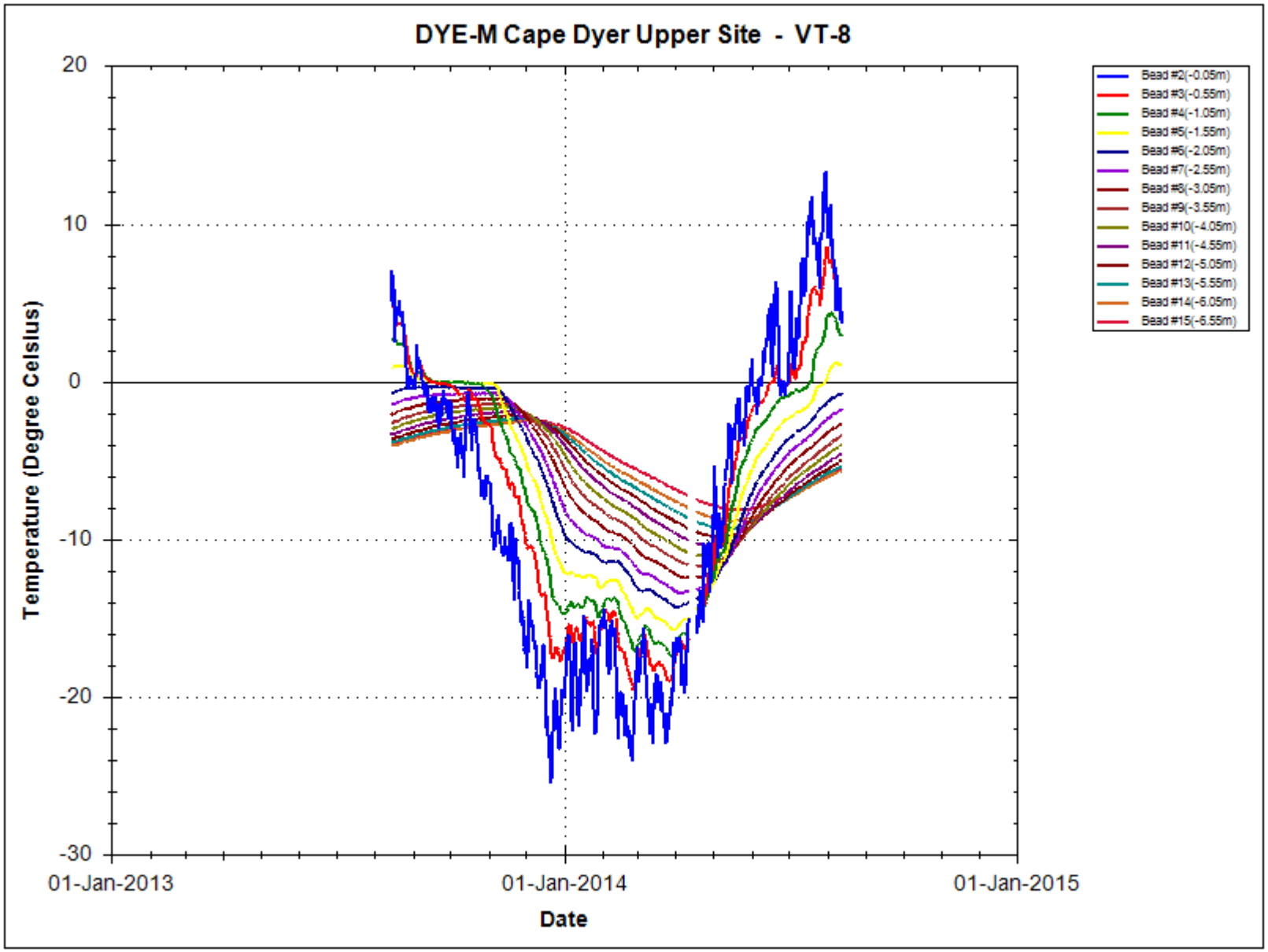

DYE-M Cape Dyer Upper Site - VT-10
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-25
-20
-15
-10
-5
0
5
10
Temperature (Degree Celsius)
08/15/2013
03/15/2014
08/13/2014
Top liner (1.6)
Top of waste (3.4)
Bottom liner (5.6)
Design active layer
0 degree (vertical)

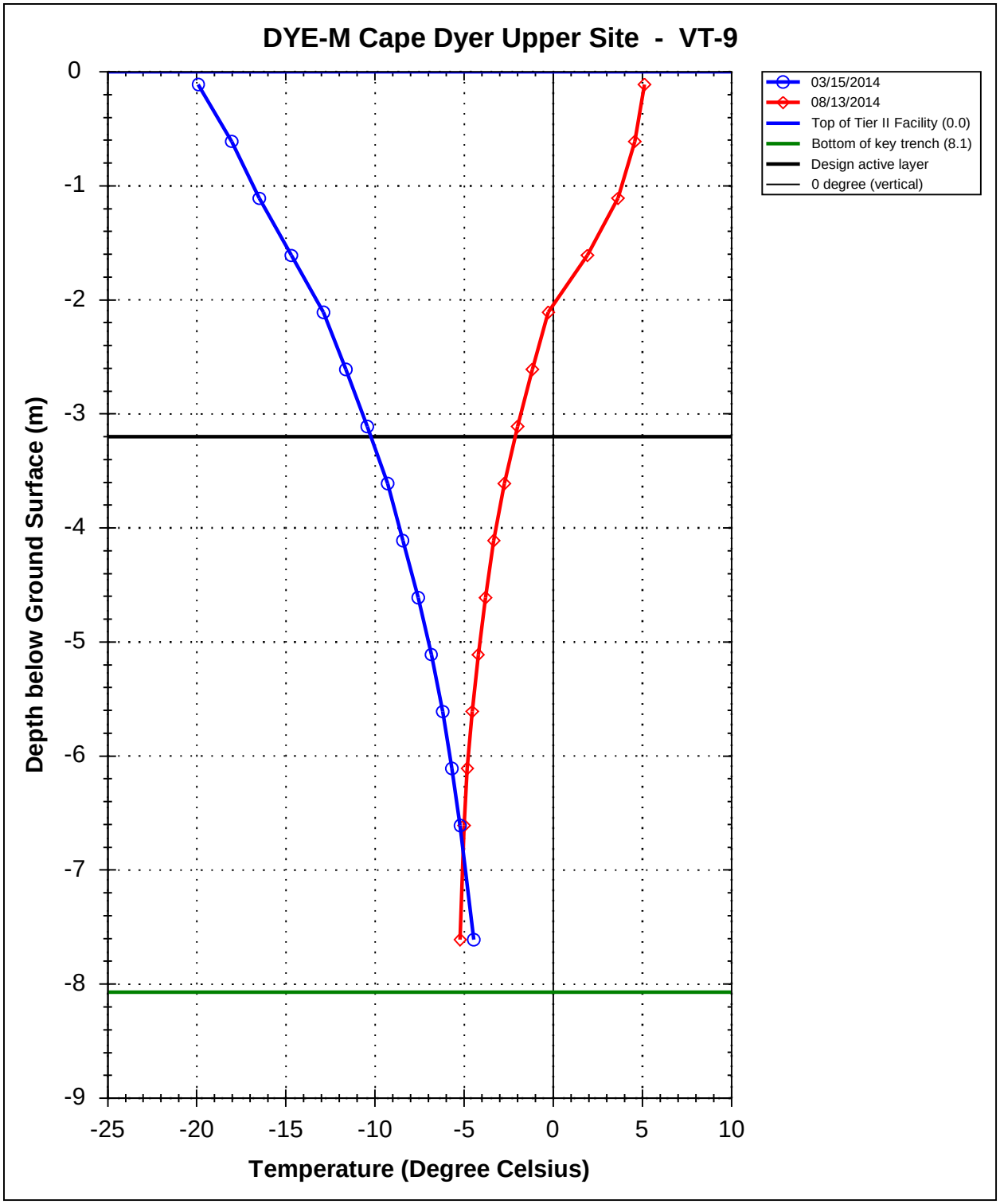

DYE-M Cape Dyer Upper Site - VT-10
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #1(-0.04m)
Bead #2(-0.54m)
Bead #3(-1.04m)
Bead #4(-1.54m)
Bead #5(-2.04m)
Bead #6(-2.54m)
Bead #7(-3.04m)
Bead #8(-3.54m)
Bead #9(-4.04m)
Bead #10(-4.54m)

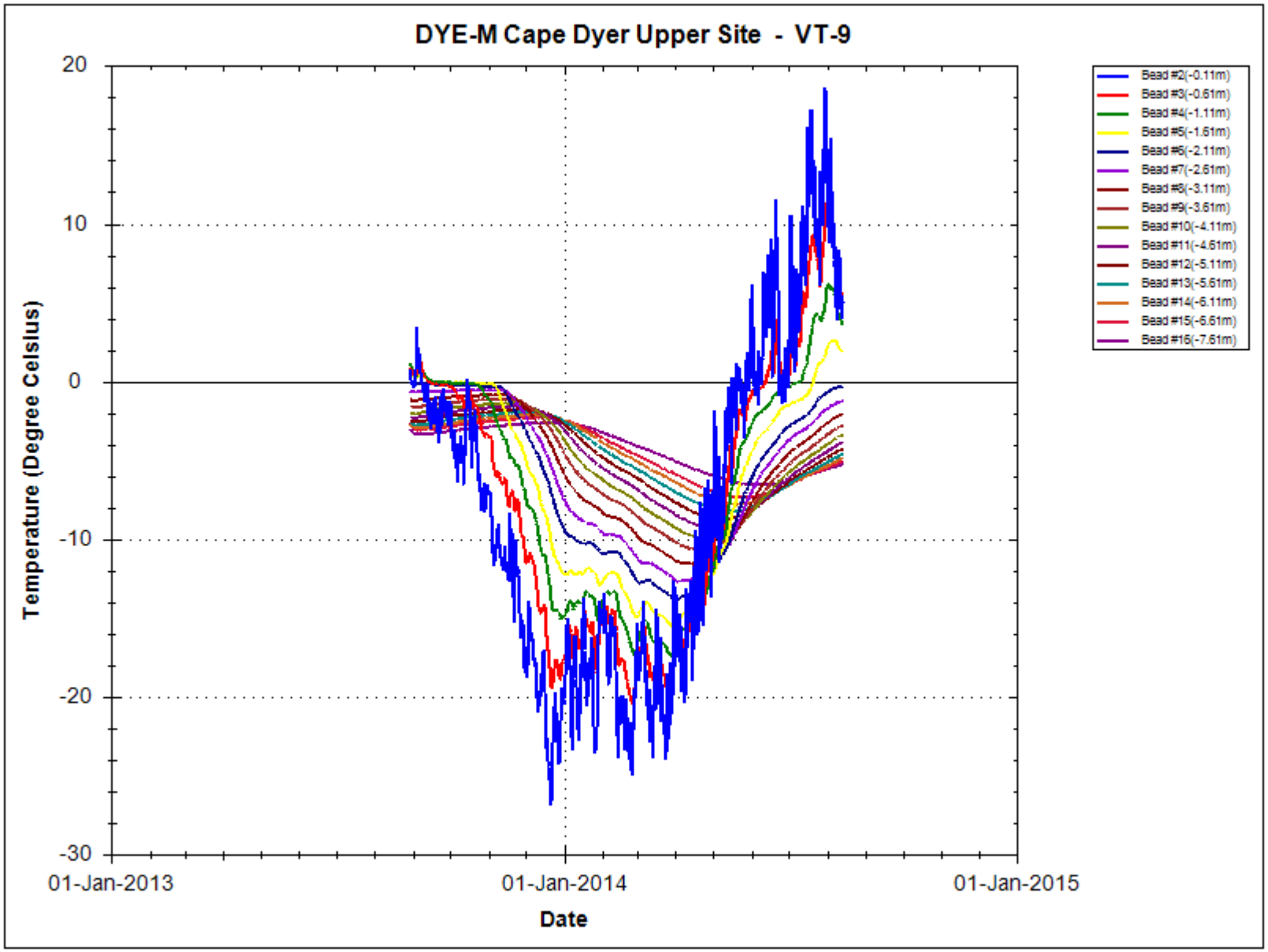

DYE-M Cape Dyer Upper Site - VT-11
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-25
-20
-15
-10
-5
0
5
10
Temperature (Degree Celsius)
08/15/2013
03/15/2014
08/13/2014
Top of Tier II Facility (0.0)
Bottom of key trench (5.0)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Upper Site - VT-11
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #3(-0.03m)
Bead #4(-0.53m)
Bead #5(-1.03m)
Bead #6(-1.53m)
Bead #7(-2.03m)
Bead #8(-2.53m)
Bead #9(-3.03m)
Bead #10(-3.53m)
Bead #11(-4.03m)
Bead #12(-4.53m)


DYE-M Cape Dyer Upper Site - VT-8
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-25
-20
-15
-10
-5
0
5
10
Temperature (Degree Celsius)
08/15/2013
03/15/2014
08/12/2014
Top of Tier II Facility (0.0)
Bottom of key trench (7.0)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Upper Site - VT-8
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #2(-0.05m)
Bead #3(-0.55m)
Bead #4(-1.05m)
Bead #5(-1.55m)
Bead #6(-2.05m)
Bead #7(-2.55m)
Bead #8(-3.05m)
Bead #9(-3.55m)
Bead #10(-4.05m)
Bead #11(-4.55m)
Bead #12(-5.05m)
Bead #13(-5.55m)
Bead #14(-6.05m)
Bead #15(-6.55m)


DYE-M Cape Dyer Upper Site - VT-9
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-25
-20
-15
-10
-5
0
5
10
Temperature (Degree Celsius)
03/15/2014
08/13/2014
Top of Tier II Facility (0.0)
Bottom of key trench (8.1)
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Upper Site - VT-9
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2013
01-Jan-2014
01-Jan-2015
Date
Bead #2(-0.11m)
Bead #3(-0.61m)
Bead #4(-1.11m)
Bead #5(-1.61m)
Bead #6(-2.11m)
Bead #7(-2.61m)
Bead #8(-3.11m)
Bead #9(-3.61m)
Bead #10(-4.11m)
Bead #11(-4.61m)
Bead #12(-5.11m)
Bead #13(-5.61m)
Bead #14(-6.11m)
Bead #15(-6.61m)
Bead #16(-7.61m)

DYE-M Cape Dyer

Upper Site Tier II Disposal Facility (Comment by Renata Klassen, Tetra Tech EBA, March 2015)

Four vertical ground temperature cables were installed in the Upper Site Tier II Disposal Facility in 2013 (VT-8 through VT-11). The four cables have provided good quality data since installation.

Maintenance reports were not available during preparation of these comments. Downloaded data indicates that:

- Dataloggers were read on August 13, 2014.

Datalogger batteries replacement dates are missing. **New batteries should be installed within 3 years of the last battery install date.**

The air temperatures in 2014 had a thawing index of 353°C-days compared to a design mean and 1:100 year thawing index of 175°C-days and 535°C-days, respectively. Climate information was taken from Cape Dyer Upper Site weather station.

Data is insufficient to comment on temperature trends in the deepest beads.

The measured maximum and minimum thaw depth in 2014 up to the data collection date was 2.1 and 1.7 m. The data collection date was not the warmest time in the year and the depth of thaw will change. The average measured up to data collection date in 2014 thaw depth of 1.9 m was less than the design active layer of 3.2 m and the estimated 1:100 year active layer of 2.4 m, but slightly greater than the estimated mean active layer of 1.8 m.

THERMAL MONITORING ANNUAL DATA ANALYSIS

Site: **DYE-M Cape Dyer Upper Site**
Landfill: **Borrow Area 2**

Design Infomation:

Design Active Layer (m):	0.00
Mean Active Layer (m):	0.00
1:100 Year Active Layer (m):	0.00
Mean Thawing Index (degC Days):	175.00
Mean Freezing Index (degC Days):	4220.00
1:100 Year Thawing Index (degC Days):	535.00

Maximum Active Layer (m):

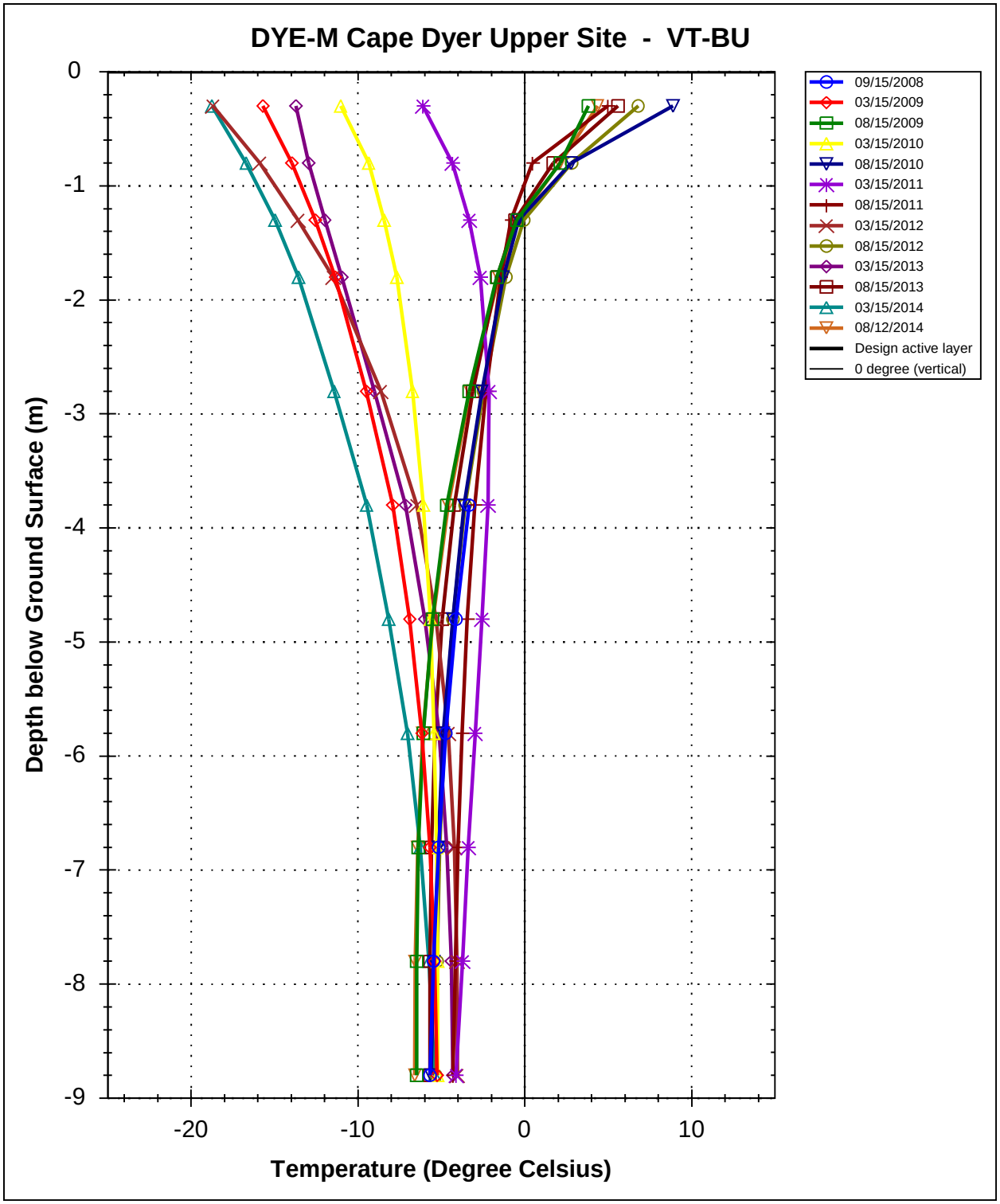
	VT-BU
2008	NaN
2009	-1.22
2010	-1.27
2011	-1.10
2012	-1.44
2013	-1.20
2014	NaN

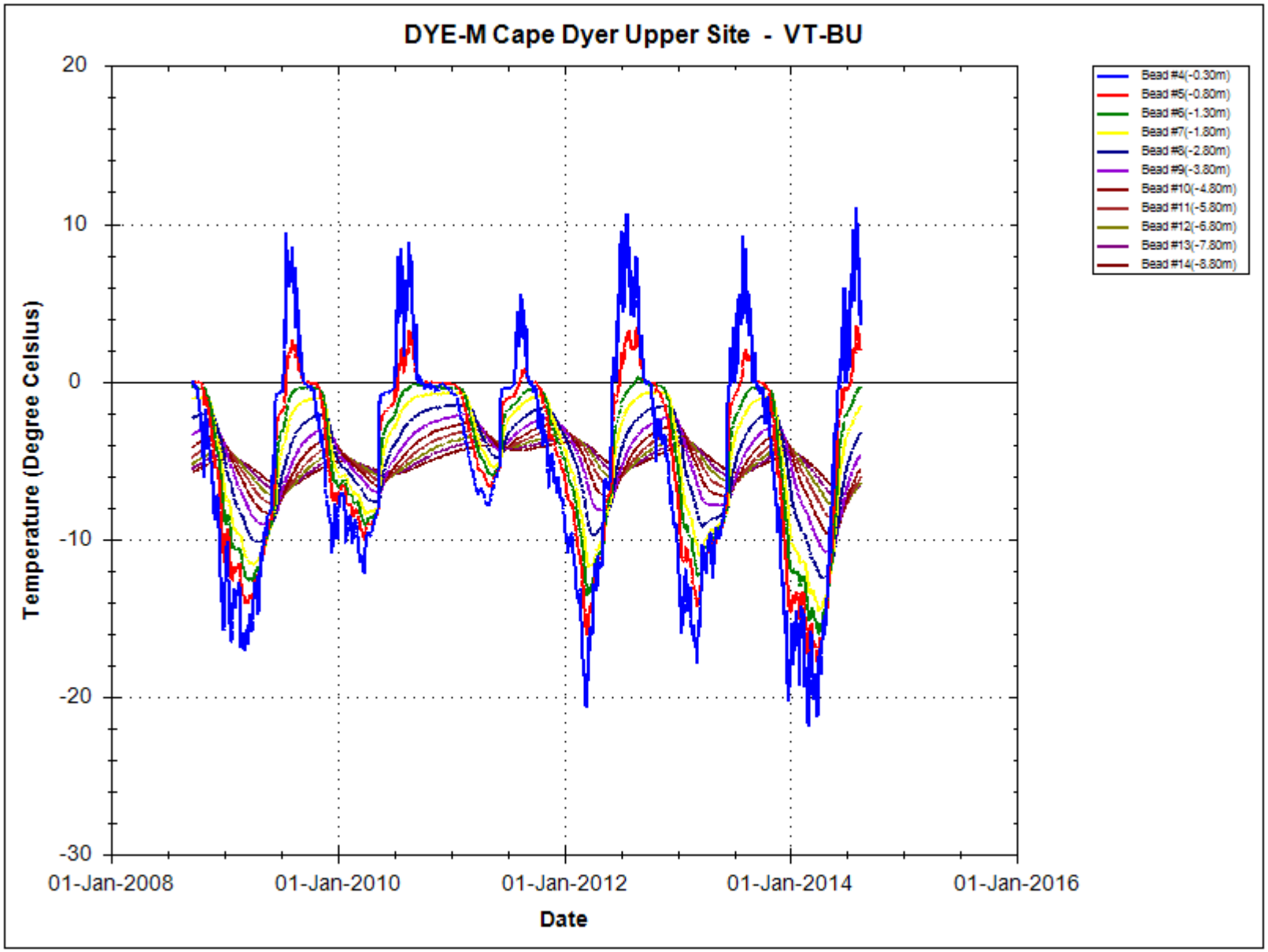
Thawing Index and Freezing Index:

	TI	FI	max AL	min AL	average AL
2008	370.00	3918.00	NaN	NaN	NaN
2009	341.00	3936.00	-1.22	-1.22	-1.22
2010	341.00	3096.00	-1.27	-1.27	-1.27
2011	266.00	NaN	-1.10	-1.10	-1.10
2012	488.00	3935.00	-1.44	-1.44	-1.44
2013	257.00	3502.00	-1.20	-1.20	-1.20
2014	353.00	4012.00	NaN	NaN	NaN

Deepest Bead Average Temperature:

	VT-BU	AVG
2008	NaN	NaN
2009	-5.75	-5.75
2010	-5.30	-5.30
2011	-4.15	-4.15
2012	-4.67	-4.67
2013	-4.97	-4.97
2014	NaN	NaN


DYE-M Cape Dyer Upper Site - VT-BU
Depth below Ground Surface (m)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-20
-10
0
10
Temperature (Degree Celsius)
09/15/2008
03/15/2009
08/15/2009
03/15/2010
08/15/2010
03/15/2011
08/15/2011
03/15/2012
08/15/2012
03/15/2013
08/15/2013
03/15/2014
08/12/2014
Design active layer
0 degree (vertical)


DYE-M Cape Dyer Upper Site - VT-BU
Temperature (Degree Celsius)
20
10
0
-10
-20
-30
01-Jan-2008
01-Jan-2010
01-Jan-2012
01-Jan-2014
01-Jan-2016
Date
Bead #4(-0.30m)
Bead #5(-0.80m)
Bead #6(-1.30m)
Bead #7(-1.80m)
Bead #8(-2.80m)
Bead #9(-3.80m)
Bead #10(-4.80m)
Bead #11(-5.80m)
Bead #12(-6.80m)
Bead #13(-7.80m)
Bead #14(-8.80m)

DYE-M Cape Dyer

Upper Site Borrow Area 2 (Comment by Renata Klassen, Tetra Tech EBA, March 2015)

One vertical ground temperature cable VT-BU was installed in the native ground near the Upper Site Tier II Disposal Facility in 2008 to provide background ground temperatures for the facility. The cable has provided good quality data since installation.

Maintenance reports were not available during preparation of these comments. Downloaded data indicates that:

- Dataloggers were read on August 13, 2014.

Datalogger batteries replacement dates are missing. **New battery should be installed within 3 years of the last battery install date.**

The air temperatures in 2014 had a thawing index of 353°C-days compared to Upper Site Tier II Disposal Facility design mean and 1:100 year thawing index of 175°C-days and 535°C-days, respectively. Climate information was taken from Cape Dyer Upper Site weather station.

The measured thaw depth in 2013 was 1.2 m. The thaw depth is less than the average thaw depth of 1.9 m measured up to the data collection date in 2014 in the Upper Site Tier II Disposal Facility.

8.5 Thermistor Annual Maintenance Reports

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/
Prepared By:	

Thermistor Information

Site Name: USHCN		Thermistor Location	
Thermistor Number: VT8		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07102057		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.34	Aux 13.02	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	12.553	5.1714
	13.282	4.2085
	13.364	4.1285
	14.151	2.9918
	15.463	1.1933
	16.929	-0.5396
	17.786	-1.5380
	18.653	-2.5034

Bead	ohms	Degrees C
	19.314	-3.1702
	19.906	-3.8077
	20.49	-4.3811
	20.86	-5.1396
	21.24	-5.3959
	21.48	-5.5780

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/13/2014
Prepared By:	MLotecki		

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number:	VT9	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110058	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.54	Aux	13.02

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.170	7.6903
	12.337	5.5756
	13.091	4.5278
	13.681	3.6466
	14.833	2.0100
	16.529	-0.1586
	17.262	-1.0008
	18.08	-1.9757

Bead	ohms	Degrees C
	18.69	-2.6017
	19.20	-3.1598
	19.69	-3.6688
	20.04	-4.0413
	20.40	-4.4128
	20.64	-4.6773
	20.79	-4.8391
	21.09	-5.1876

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/13/2014
Prepared By:	

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number:	V13	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	0711 00 59	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.34	Aux 13.26	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	12.985	4.6051
	12.976	4.6700
	13.771	3.4718
	15.975	0.5073
	17.156	-0.8835
	18.068	-1.9026
	18.725	-2.6224
	19.452	-3.3526

Bead	ohms	Degrees C
	20.05	-3.9756
	20.66	-4.5502

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/13/2014
Prepared By:	Mcotech		

Thermistor Information

Site Name:	US 412 II	Thermistor Location	U411
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110051	Cable Serial Number	

2501 Master Key.

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2013		
Battery Levels	Main 11.34	Aux 13.36	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.482	6.4694
	11.699	6.2121
	12.953	4.6151
	13.079	3.6566
	13.654	1.6887
	15.079	-0.3769
	16.724	-1.3075
	17.499	

≈ 4.5278

Bead	ohms	Degrees C
	18.28	-2.1652
	19.09	-3.0057
	19.74	-3.6871
	20.20	-4.1650

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/13/2014
Prepared By:	

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number: VTBV		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110028		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date		
Battery Levels	Main 11.34	Aux 13.38

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	10.111	9.5846
	10.287	9.6175
	10.449	8.7273
	13.498	3.8114
	14.903	1.9147
	16.512	-0.1586
	17.544	-1.3408
	19.167	-3.0427

Bead	ohms	Degrees C
	20.51	-4.4234
	21.45	-5.3451
	22.12	-5.9381
	22.32	-6.2243
	22.42	-6.3841
	22.42	-6.4140

Observations and Proposed Maintenance

9. West Landfill – West Lobe

9.1 Visual Inspection

The West Landfill – West Lobe visual inspection was completed on August 10, 2014. The West Landfill is located approximately 800 m west of the Upper Site Station area and north of the main access road. The West Lobe is a large, irregular shaped lobe occupying an area of approximately 19,000 m^2. The landfill was well covered and has a surface grade between 10% and 15%, and beyond the toe the grade becomes steeper, at about 20%. The landfill was capped with between 0.3 and 0.75 m Type 2 granular fill along the top surface and north and west side slopes of the landfill with between 04 and 0.75 m Type 1 granular fill armouring the south and east side slopes. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

9.1.1 Settlement

Two small areas of erosion were noted along the west edge and the centre west edge of the landfill. The erosion was minor and estimated to cover less than 5% of the surface of the landfill.

9.1.2 Erosion

There were no erosion features observed during this inspection.

9.1.3 Frost Action

Frost action was not observed at the site.

9.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

9.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

9.1.6 Staining

There was no staining noted during this inspection.

9.1.7 Seepage Points

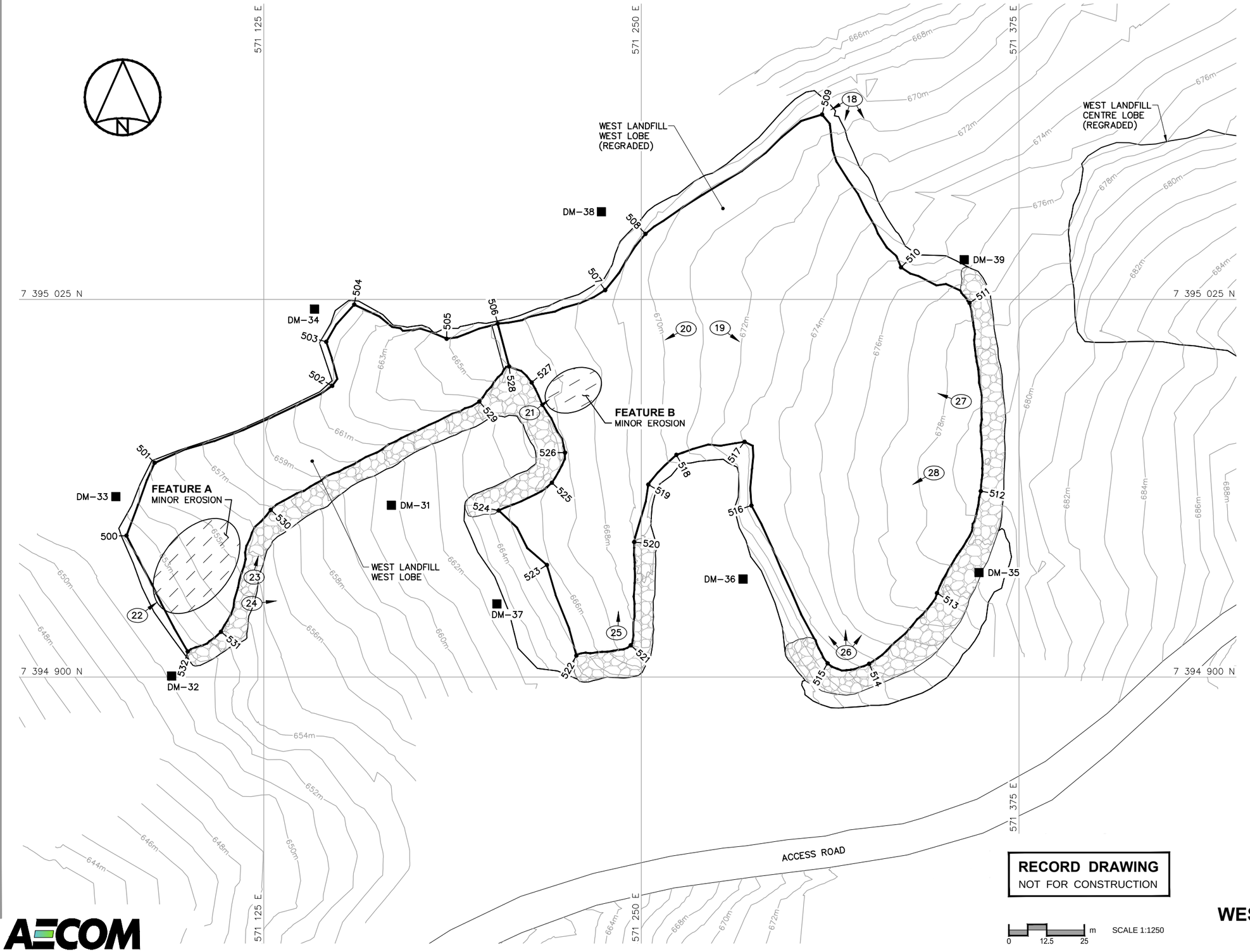
Seepage was not noted at the landfill.

9.1.8 Debris

Surface debris was not observed.

9.1.9 Discussion

There was minor evidence of settlement and therefore, the landfill performance is rated as acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 500 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (9)
- MINOR EROSION
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT

WEST LANDFILL–WEST LOBE REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
500	7 394 946.8	571 079.6	652.3
501	7 394 970.9	571 088.9	655.3
502	7 394 996.4	571 147.7	661.3
503	7 395 011.0	571 145.7	660.5
504	7 395 023.3	571 155.0	660.6
505	7 395 012.0	571 185.6	664.9
506	7 395 017.0	571 202.5	666.2
507	7 395 028.1	571 238.0	668.7
508	7 395 046.7	571 251.4	669.3
509	7 395 086.2	571 309.8	670.5
510	7 395 035.6	571 336.0	675.3
511	7 395 023.9	571 358.6	678.3
512	7 394 961.5	571 362.4	679.5
513	7 394 927.8	571 347.9	677.6
514	7 394 904.4	571 325.4	673.5
515	7 394 904.6	571 311.6	672.0
516	7 394 956.8	571 286.4	673.4
517	7 394 977.9	571 284.2	673.0
518	7 394 973.6	571 261.6	670.3
519	7 394 963.7	571 252.3	669.4
520	7 394 944.7	571 247.6	669.0
521	7 394 910.5	571 246.5	667.6
522	7 394 907.1	571 228.5	664.8
523	7 394 937.1	571 218.8	665.8
524	7 394 955.1	571 202.8	664.5
525	7 394 964.3	571 220.4	666.2
526	7 394 974.3	571 224.8	666.8
527	7 394 997.5	571 213.7	666.2
528	7 395 002.8	571 206.2	666.0
529	7 394 991.2	571 196.4	663.9
530	7 394 955.4	571 127.3	656.8
531	7 394 915.0	571 110.8	653.4
532	7 394 908.5	571 099.8	651.5

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

WEST LANDFILL - WEST LOBE

FIGURE DYE-M.8

AECOM

9.2 Photographic Record

Photos 18 through 28

Photograph 18. North portion of the landfill looking south ↑

Photograph 19. Centre of the landfill looking east ↑

Photograph 20. Centre of the landfill looking west ↑

Photograph 21. Area of minor erosion ↑

Photograph 22. Area of minor erosion ↑

Photograph 23. Type 1 granular fill along the south toe ↑

Photograph 24. Looking east at the south portion of the landfill ↑

Photograph 25. Looking north from the south-centre portion of the landfill ↑

Photograph 26. Looking north from the southeast portion of the landfill ↑

Photograph 27. **Looking northwest across the landfill from the east berm ↑**

Photograph 28. **Looking southwest across the landfill from the east berm ↑**

9.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	West Landfill - West Lobe
Date of Inspection:	10-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	Yes	Features A and B - Eroded areas noted at the centre and West end of regraded landfill	Length of area up to approximately 20 m	Width of area up to approximately 20 m	Up to approximately 50 mm	Less than 5%.		Pictures 021, 022		Occasional	Acceptable
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	No									None	
Landfill Performance											Acceptable

DYE-M Cape Dyer
West Landfill - West Lobe
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

10. West Landfills – Centre Lobe, Centre Lobe A and East Lobe

10.1 Visual Inspection

The West Landfills – Centre Lobe, Centre Lobe A and East Lobe visual inspection was completed on August 10, 2014. The Centre Lobe and Centre A Lobe are located immediately west of the road to the abandoned airstrip and the winter water supply lake. The south portion of the lobes has a surface grade between 10% and 15% and beyond the toe the grade becomes steeper, at about 20%. The landfill occupies an area of about 13,000 m^2. The East Lobe is located east of the access road to the abandoned airstrip and the winter water supply lake. The East Lobe occupies an area of 2,500 m^2 and is located immediately south of a large bedrock outcrop. The Centre Lobe was covered with 0.75 m Type 2 granular fill over the surface of the landfill with 0.5 m Type 1 granular fill as armouring along the north and east side slopes. Centre Lobe A was covered with 0.75 m Type 2 granular fill over its entirety. The East Lobe was covered with 0.75 m Type 2 granular fill with 0.75 m Type 1 granular fill armouring along the east and west side slopes. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

10.1.1 Settlement

A slight depression was noted at the south toe of the Centre Lobe, likely from settlement of the granular fill. Minor tension cracks were seen along the north edge of the East Lobe.

10.1.2 Erosion

There were no erosion features observed during this inspection.

10.1.3 Frost Action

Frost action was not observed at the site.

10.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

10.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

10.1.6 Staining

There was no staining noted during this inspection.

10.1.7 Seepage Points

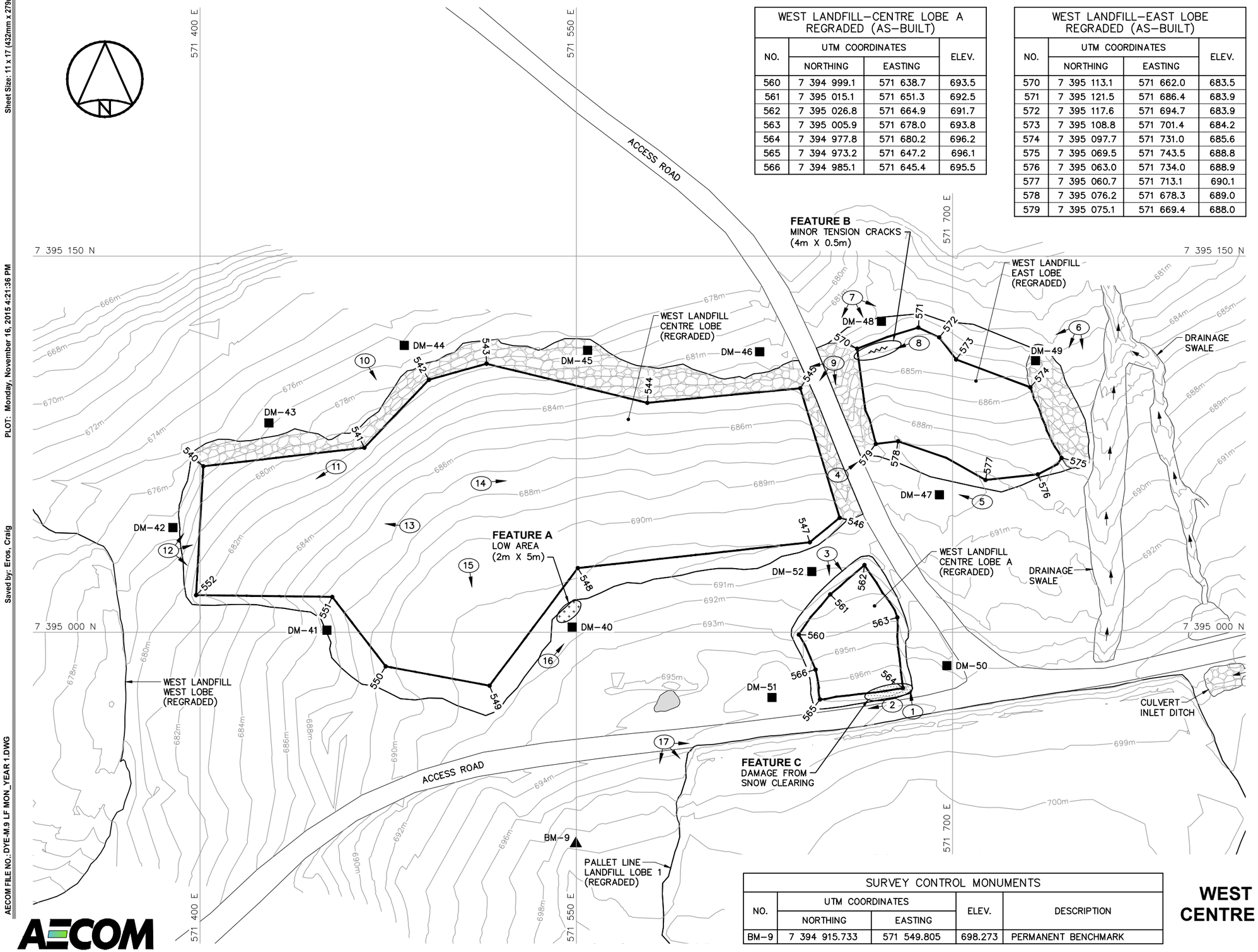
Seepage was not noted at the landfill.

10.1.8 Debris

Surface debris was not observed.

10.1.9 Discussion

There was some damage noted on the south edge of the Centre Lobe A. The damage to Centre Lobe A is likely as a result of road clearing activities. There was minor evidence of settlement and therefore, the landfill performance is rated as acceptable.



WEST LANDFILL–CENTRE LOBE A REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
560	7 394 999.1	571 638.7	693.5
561	7 395 015.1	571 651.3	692.5
562	7 395 026.8	571 664.9	691.7
563	7 395 005.9	571 678.0	693.8
564	7 394 977.8	571 680.2	696.2
565	7 394 973.2	571 647.2	696.1
566	7 394 985.1	571 645.4	695.5

WEST LANDFILL–EAST LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
570	7 395 113.1	571 662.0	683.5
571	7 395 121.5	571 686.4	683.9
572	7 395 117.6	571 694.7	683.9
573	7 395 108.8	571 701.4	684.2
574	7 395 097.7	571 731.0	685.6
575	7 395 069.5	571 743.5	688.8
576	7 395 063.0	571 734.0	688.9
577	7 395 060.7	571 713.1	690.1
578	7 395 076.2	571 678.3	689.0
579	7 395 075.1	571 669.4	688.0

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM–9 — PERMANENT BENCHMARK LOCATION (1)
- 540 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (13)
- OTHER VISUAL OBSERVATIONS
- LOW AREA
- CRACKING (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

WEST LANDFILL–CENTRE LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
540	7 395 066.2	571 401.3	677.4
541	7 395 073.6	571 465.5	681.2
542	7 395 100.7	571 491.2	680.3
543	7 395 107.1	571 514.2	680.6
544	7 395 091.5	571 578.3	684.4
545	7 395 097.3	571 639.3	683.5
546	7 395 045.7	571 655.0	690.4
547	7 395 035.9	571 643.1	690.6
548	7 395 025.6	571 550.6	690.9
549	7 394 978.7	571 515.4	692.0
550	7 394 986.4	571 474.0	689.7
551	7 395 014.1	571 452.7	687.3
552	7 395 014.8	571 398.4	681.6

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM–9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK

RECORD DRAWING
NOT FOR CONSTRUCTION

0 15 30 m SCALE 1:1500

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

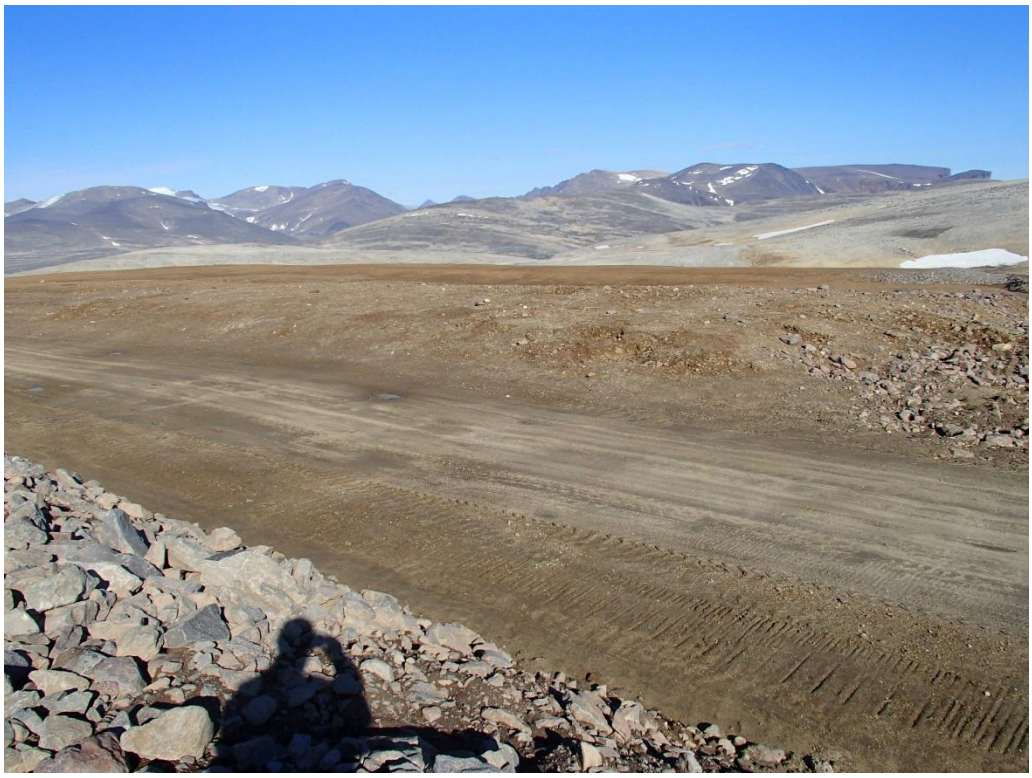
WEST LANDFILL - CENTRE LOBE, CENTRE LOBE A AND EAST LOBE

FIGURE DYE-M.9

AECOM

10.2 Photographic Record

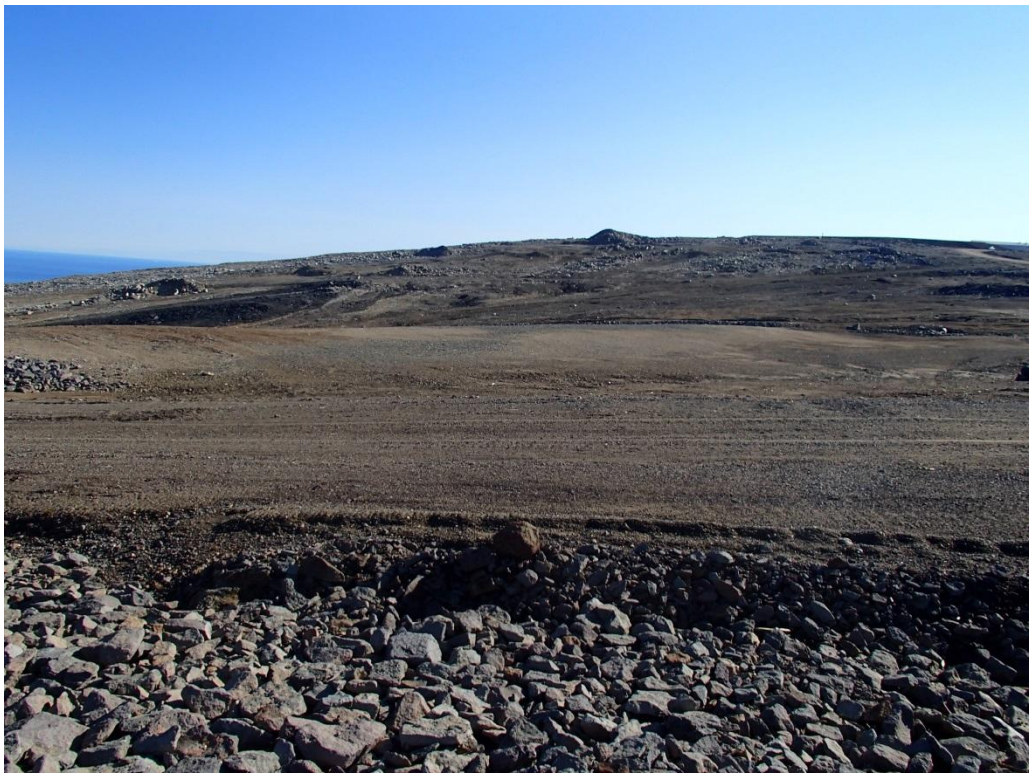
Photos 1 through 17



Photograph 1. Damage on the southeast corner of the Centre Lobe A ↑

Photograph 2. Damage to the southeast corner of the Centre Lobe A ↑

Photograph 3. Overview of the Centre Lobe A looking south from north side ↑



Photograph 4. Looking east over the surface of the East Lobe ↑

Photograph 5. **Looking northwest along the south berm of the East Lobe ↑**

Photograph 6. Looking southwest over the East Lobe ↑

Photograph 7. Looking southeast over the East Lobe ↑

Photograph 8. Minor cracking on the surface of the East Lobe ↑

Photograph 9. Overview of the northeast corner of the Centre Lobe ↑

Photograph 10. Overview of the northwest portion of the Centre Lobe ↑

Photograph 11. Looking southwest over the west portion of the Centre Lobe ↑

Photograph 12. Looking east from the west berm of the Centre Lobe ↑

Photograph 13. Overview looking west from the centre of the Centre Lobe ↑

Photograph 14. Overview of the Centre Lobe looking east from the centre of the landfill ↑

Photograph 15. Overview looking south of the Centre Lobe ↑

Photograph 16. Low area at the south toe of the Centre Lobe ↑

Photograph 17. Looking south at the Pallet Line Landfill ↑

10.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	West Landfill - Centre Lobe, Centre Lobe A and East Lobe
Date of Inspection:	10-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	Yes	Feature A - Low area observed at South toe of Centre Lobe	Approximately 20 m	Approximately 5 m	Up to Approximately 100 mm	Less than 1%.		Picture 016		Isolated	Acceptable
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	Yes	Feature B - Minor tension cracks along the North edge of the East Lobe	Approximately 4 m	Approximately 0.5 m		Less than 1%		Picture 008		Occasional	Acceptable
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Feature C - Damage to regrade noted along South edge of Centre Lobe A	Approximately 20 m	Approximately 4 m	Up to Approximately 150 mm	Less than 1%		Pictures 001, 002		Isolated	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer

West Landfill - Centre Lobe, Centre Lobe A and East Lobe

Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

11. Pallet Line Landfills

11.1 Visual Inspection

The Pallet Line Landfill visual inspection was completed on August 10 and August 14, 2014. The Pallet Line Landfill is located south of the main access road at the Pallet Line area of the Upper Site. The landfill consists of five lobes plus the abandoned landfill lobe and occupies a total area of approximately 29,800 m^2. All six lobes of the landfill were covered with 0.75 m Type 2 granular material, with between 0.5 to 0.75 m Type 1 granular on several side slopes to provide erosion protection in potential high run-off areas. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

11.1.1 Settlement

An area of erosion was noted at the south end of Lobe 2 and an area of segregation was noted in the centre of the lobe. Lobes 1 and 3 had minor tension cracks.

11.1.2 Erosion

There were no erosion features observed during this inspection.

11.1.3 Frost Action

Frost action was not observed at the site.

11.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

11.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

11.1.6 Staining

There was no staining noted during this inspection.

11.1.7 Seepage Points

Seepage was not noted at the landfill.

11.1.8 Debris

Surface debris was not observed.

11.1.9 Discussion

Lobes 2, 3, 4, 5 and the Abandoned Landfill Lobe had tire tracks on the top surface. There was minor evidence of settlement and therefore, the landfill performance is rated as acceptable.

PALLET LINE LANDFILL–LOBES 2,3,4 REGRADED (AS–BUILT)															
NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING			NORTHING	EASTING			NORTHING	EASTING			NORTHING	EASTING	
620	7 394 821.6	571 754.3	698.8	628	7 394 933.9	571 938.8	704.9	636	7 394 850.9	571 902.5	700.0	645	7 394 761.8	571 776.5	694.4
621	7 394 876.7	571 808.9	700.1	629	7 394 912.7	571 946.1	704.4	637	7 394 850.1	571 861.8	699.7	646	7 394 759.7	571 759.9	694.6
622	7 394 909.2	571 852.5	701.6	630	7 394 894.9	571 957.1	704.4	638	7 394 839.1	571 862.2	698.6	647	7 394 766.9	571 749.9	695.3
623	7 394 931.0	571 870.9	702.7	631	7 394 889.1	571 954.9	704.4	639	7 394 815.1	571 839.6	697.1	648	7 394 784.4	571 744.1	696.1
624	7 394 923.5	571 877.7	702.9	632	7 394 883.0	571 943.0	703.3	640	7 394 795.1	571 857.7	695.9	649	7 394 800.5	571 743.8	696.8
625	7 394 915.1	571 896.4	702.4	633	7 394 885.0	571 932.7	702.6	641	7 394 781.9	571 853.8	695.1	650	7 394 821.9	571 789.7	697.9
626	7 394 917.3	571 915.1	703.8	634	7 394 881.5	571 924.1	702.6	642	7 394 772.7	571 841.8	694.4	651	7 394 840.0	571 787.1	699.3
627	7 394 930.7	571 930.2	704.5	635	7 394 853.3	571 908.1	700.1	643	7 394 757.4	571 807.0	693.2	652	7 394 867.0	571 810.4	699.7
								644	7 394 777.1	571 789.5	694.9	653	7 394 899.8	571 856.0	701.4

PALLET LINE LANDFILL–LOBE 1 REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
580	7 394 947.7	571 598.4	696.8
581	7 394 977.1	571 787.5	697.8
582	7 394 956.8	571 795.4	699.1
583	7 394 925.3	571 815.6	700.1
584	7 394 899.6	571 800.7	700.0
585	7 394 862.0	571 756.9	699.7
586	7 394 862.2	571 728.9	700.2
587	7 394 901.9	571 719.3	701.0
588	7 394 901.4	571 702.2	700.9
589	7 394 867.1	571 666.0	700.9
590	7 394 879.9	571 588.2	701.5
591	7 394 920.3	571 595.5	700.0

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM–9 — PERMANENT BENCHMARK LOCATION (1)
- 580 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (10)
- LOW AREA
- SEGREGATION
- MINOR EROSION
- CRACKING (NTS)
- TIRE TRACKS
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

PALLET LINE LANDFILL–ABANDONED LANDFILL LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
600	7 394 866.5	571 551.1	700.6
601	7 394 872.4	571 558.3	700.9
602	7 394 874.4	571 564.7	701.2
603	7 394 857.5	571 582.4	701.1
604	7 394 850.7	571 585.1	700.8
605	7 394 772.0	571 601.4	694.9
606	7 394 763.2	571 577.7	692.9
607	7 394 774.4	571 546.4	691.6
608	7 394 815.7	571 561.0	697.7

PALLET LINE LANDFILL–LOBE 5 REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
610	7 394 929.4	571 962.8	705.3
611	7 394 930.6	571 983.7	707.1
612	7 394 933.4	571 996.8	707.9
613	7 394 921.6	571 998.5	707.4
614	7 394 912.6	571 997.8	706.6
615	7 394 920.3	571 964.0	705.0

RECORD DRAWING
NOT FOR CONSTRUCTION

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM–9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

PALLET LINE LANDFILL LOBES 1, 2, 3, 4, 5 AND ABANDONED LANDFILL LOBE

FIGURE DYE-M.10

AECOM

11.2 Photographic Record

Photos 65 through 121

Photograph 65. Looking west at Lobe 5 ↑

Photograph 66. Looking south at northeast corner of Lobe 5 ↑

Photograph 67. Tire tracks between Lobes 2, 3, 4 and 5 ↑

Photograph 68. Overview of the northeast corner of Lobes 2, 3, and 4 ↑

Photograph 69. Tire tracks on the surface of Lobes 2, 3 and 4 ↑

Photograph 70. Minor tension cracks at Lobes 2, 3 and 4 ↑

Photograph 71. **Looking east from the centre of Lobes 2, 3, and 4 ↑**

Photograph 72. **Looking west from the centre of Lobes 2, 3, and 4 ↑**

Photograph 73. Area of segregation at the centre of Lobes 2, 3, and 4 ↑

Photograph 74. **Looking northeast from the south portion of Lobes 2, 3, and 4 ↑**

Photograph 75. **Area of erosion at Lobes 2, 3 and 4 ↑**

Photograph 76. Low area and area of minor erosion on Lobes 2, 3 and4 ↑

Photograph 77. Rough area on the surface of Lobes 2, 3 and4 ↑

Photograph 78. Looking northeast across Lobes 2, 3, and 4 ↑

Photograph 79. Overview of the southeast side of Lobe 1 ↑

Photograph 80. Minor tension cracks on Lobe 1 ↑

Photograph 81. Surface of Lobe 1 looking northeast from the southeast corner ↑

Photograph 82. Looking east over Lobe 1 from the centre of the landfill ↑

Photograph 83. Looking west over Lobe 1 from the centre of the landfill ↑

Photograph 115. Northwest corner of Lobe 1 ↑

Photograph 116. Looking south from the northeast of Lobe 1 ↑

Photograph 117. Overview of Lobe 1 from the southwest corner ↑

Photograph 118. Overview of the Abandoned Landfill Lobe from the north side ↑

Photograph 119. Looking south from the centre of the Abandoned Landfill Lobe ↑

Photograph 120. Looking east from the southeast corner of the Abandoned Landfill Lobe ↑

Photograph 121. Southwest corner of the Abandoned Landfill Lobe ↑

11.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Pallet Line Landfill Lobes 1, 2, 3, 4, 5 and Abandoned Lobe
Date of Inspection:	8/10/2014 and 8/14/2014
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky

The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Signature:

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	Yes	Features A and B - Eroded areas noted at the centre of the south end of regraded landfill Lobe 2.	Areas up to approximately 20 m long	Areas up to approximately 1 m wide	Up to approximately 50 mm	Less than 1%.		Pictures 075 and 076		Occasional	Acceptable
Frost Action	No									None	
Sloughing and Cracking	Yes	Features C and D - Minor tension cracks along the South edges of Lobes 1 and 3 on the side slope	Areas approximately 4 m long	Areas approximately 0.5 m wide		Less than 1%		Pictures 070 and 080.		Occasional	Acceptable
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Tire Tracks (Features E and F) and areas of segregation (Features G and H) observed on surface. One small area of ponded water between Lobes 4 and 5 (Feature I). A low area on the centre portion of Lobe 2 (Feature J).	E and F - areas approximately 40 m	E and F - areas approximately 20 m		Approximately 1%		Pictures 067, 069, 073, 076, 077 and 120		Numerous	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Pallet Line Landfill Lobes 1, 2, 3, 4, 5 and Abandoned Lobe
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

12. Upper Site Non-Hazardous Waste Landfill

12.1 Visual Inspection

The Upper Site Non-Hazardous Waste Landfill inspection was completed on August 10, 2014. The landfill is located approximately 250 m west of the station area along the main access road. The landfill was capped with 1.0 m Type 2 granular fill and with Type 1 granular fill on all side slopes. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

12.1.1 Settlement

Indications of settlement were not observed during the inspection.

12.1.2 Erosion

There were no erosion features observed during this inspection.

12.1.3 Frost Action

Frost action was not observed at the site.

12.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

12.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

12.1.6 Staining

There was no staining noted during this inspection.

12.1.7 Seepage Points

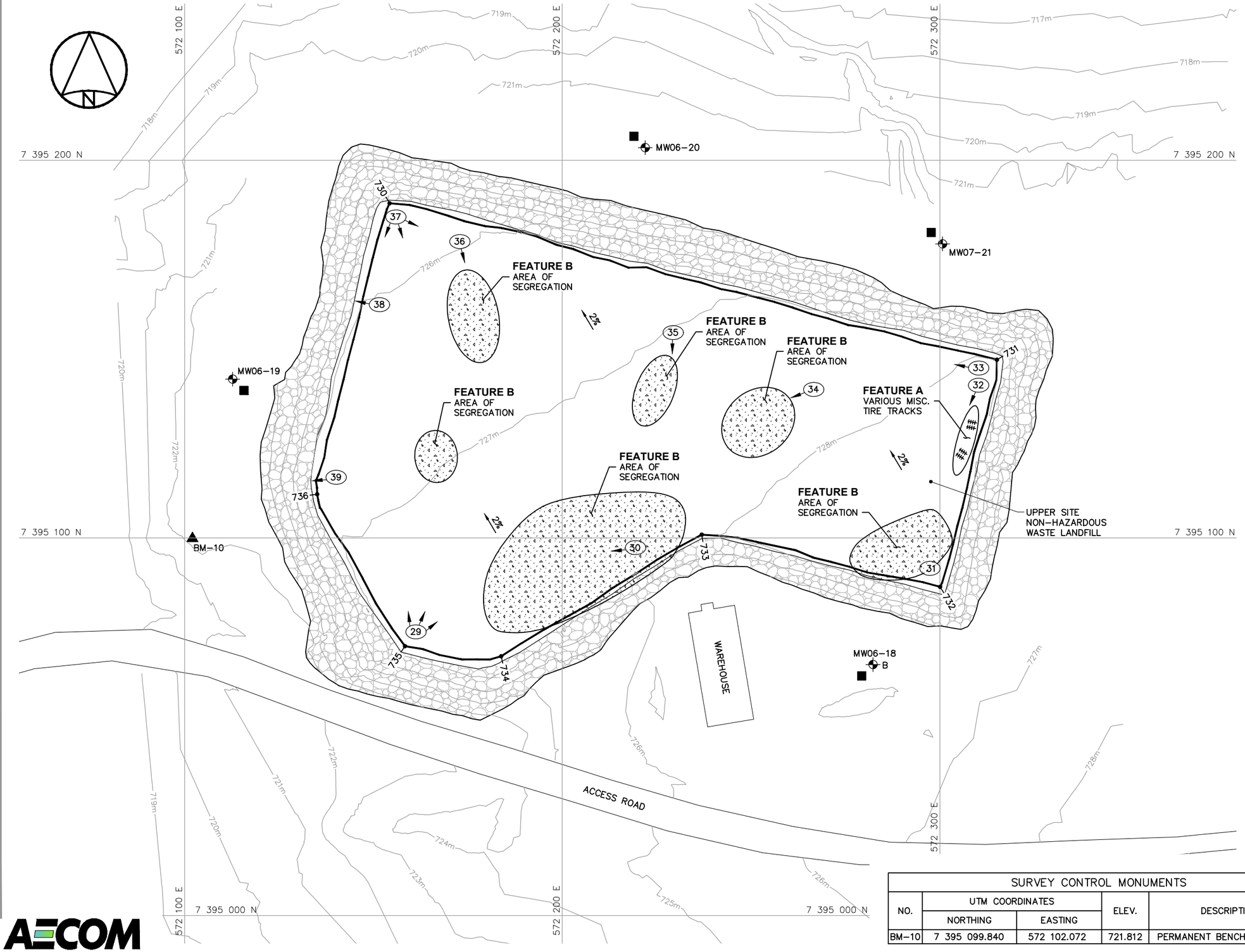
Seepage was not noted at the landfill.

12.1.8 Debris

Surface debris was not observed.

12.1.9 Discussion

Tire tracks were observed on the surface of the landfill. Several areas of segregation were seen across the top of the landfill. There was no evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-10 — PERMANENT BENCHMARK LOCATION (1)
- 730 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- MONITORING SOIL SAMPLE LOCATION (4)
- SEGREGATION
- TIRE TRACKS (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

UPPER SITE
NON-HAZARDOUS WASTE LANDFILL
FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
730	7 395 188.6	572 154.3	725.6
731	7 395 147.2	572 315.1	728.0
732	7 395 087.0	572 300.1	728.8
733	7 395 100.9	572 237.0	727.9
734	7 395 068.7	572 183.8	728.0
735	7 395 071.3	572 158.4	727.7
736	7 395 111.6	572 135.1	726.7

UPPER SITE
NON-HAZARDOUS WASTE LANDFILL
MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW06-18	7 395 066.5	572 282.3	725.6
MW06-19	7 395 142.0	572 112.7	722.5
MW06-20	7 395 203.3	572 222.0	720.6
MW07-21	7 395 177.9	572 300.7	721.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

SURVEY CONTROL MONUMENTS

NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-10	7 395 099.840	572 102.072	721.812	PERMANENT BENCHMARK

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE NON - HAZARDOUS WASTE LANDFILL

FIGURE DYE-M.11

12.2 Photographic Record

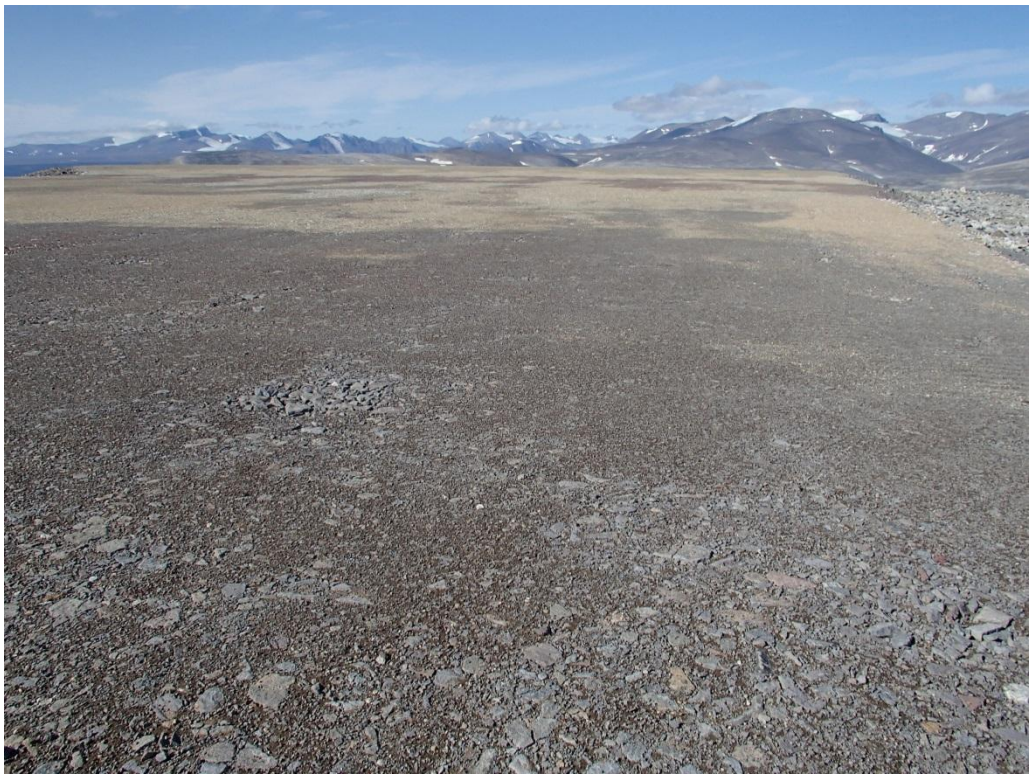
Photos 29 through 39

Photograph 29. Looking northeast from the south berm ↑

Photograph 30. **Area of segregation on the south portion of the landfill ↑**

Photograph 31. **Area of segregation on the southeast corner of the landfill ↑**

Photograph 32. **Tire tracks on the east side of the landfill ↑**



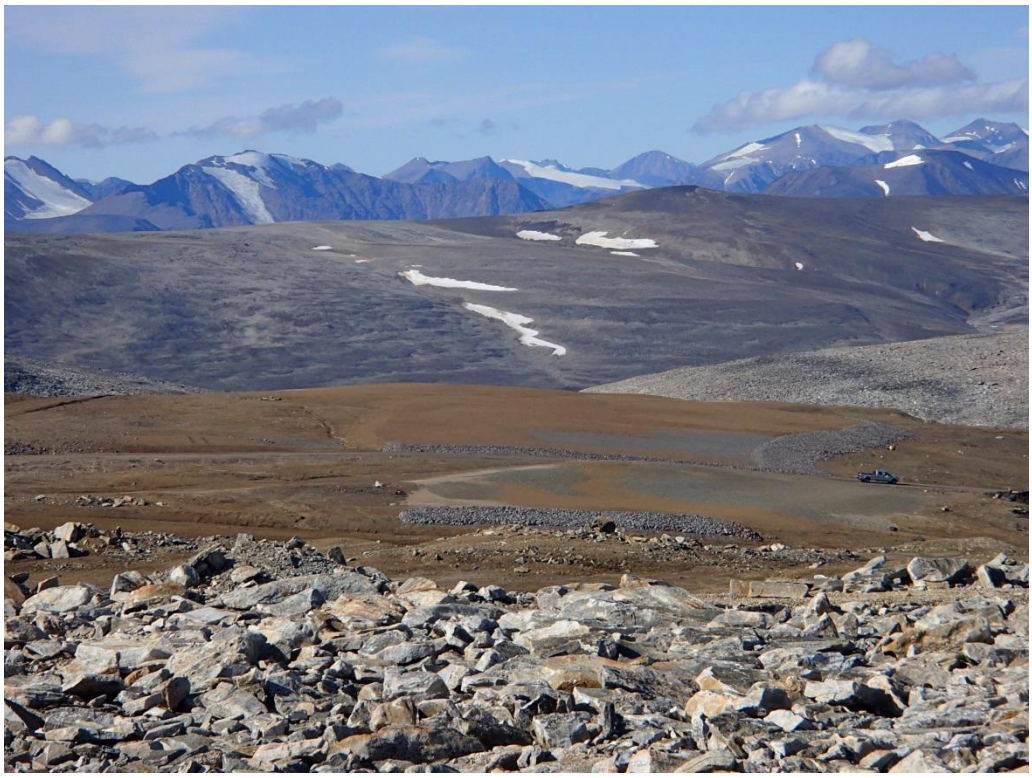
Photograph 33. **Looking west from the northeast corner of the landfill ↑**

Photograph 34. Area of segregation ↑

Photograph 35. Area of segregation ↑

Photograph 36. Area of segregation ↑

Photograph 37. Looking southeast from the northwest corner of the landfill ↑



Photograph 38. Looking west off the west berm of the landfill ↑

Photograph 39. Looking southwest at the Pallet Line Landfill ↑

12.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Upper Site Non - Hazardous Waste Landfill
Date of Inspection:	10-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky

The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Signature:

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Feature A - Tire tracks observed on surface of landfill. Areas of segregation observed on surface of landfill (See Drawings- labeled B)	A - Approx. 10 m	A - Approx. 0.2 m	A - Approx. 0.03 m	A - Less than 1% B - Less than 50%.		Pictures 029 - 037		Numerous	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
Upper Site Non - Hazardous Waste Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

13. Upper Site NWS Landfill

13.1 Visual Inspection

The upper Site NWS Landfill visual inspection was completed on August 10, 2014. The NWS Landfill at the Upper Site is located approximately 200 m southwest of the Upper Site Main Station area. The landfill occupies an area of approximately 4,700 m^2. Geophysical data indicates that substantial debris is buried in the east half of the landfill. The landfill was covered with 0.75 m Type 2 granular fill with a 0.5 m Type 1 ditch along the east side slope. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

13.1.1 Settlement

Indications of settlement were not observed during the inspection.

13.1.2 Erosion

An area of sedimentation was observed in a low area in the centre of the regrade.

13.1.3 Frost Action

Frost action was not observed at the site.

13.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

13.1.5 Re-establishment of Vegetation

There was no vegetation present at the time of the inspection.

13.1.6 Staining

There was no staining noted during this inspection.

13.1.7 Seepage Points

Seepage was not noted at the landfill.

13.1.8 Debris

A piece of deposited debris was noted off the south toe of the landfill.

13.1.9 Discussion

There was no evidence of settlement or slope stability issues and therefore, the landfill performance is rated as acceptable.

572 500 E
572 575 E
572 650 E
7 394 725 N
7 394 650 N
DM–22
DM–18
DM–21
DM–20
DM–19
ACCESS ROAD
HELIPAD AREA (REGRADED)
FEATURE A SEDIMENTATION (20m X 1m)
FEATURE B DEBRIS
UPPER SITE NWS LANDFILL (REGRADED)
SOUTH LANDFILL–WEST (REGRADED)

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 430 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- SEDIMENTATION
- ◇ — STEEL DEBRIS (NTS)
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT

UPPER SITE NWS LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
430	7 394 739.9	572 508.8	730.1
431	7 394 750.8	572 538.1	733.3
432	7 394 748.2	572 554.1	734.0
433	7 394 726.1	572 596.3	733.9
434	7 394 708.5	572 604.0	733.8
435	7 394 692.1	572 623.2	733.1
436	7 394 676.8	572 625.8	730.8
437	7 394 638.9	572 625.2	727.2
438	7 394 637.2	572 597.5	727.5
439	7 394 648.6	572 578.2	727.7
440	7 394 663.6	572 578.4	728.8
441	7 394 674.8	572 560.2	728.2
442	7 394 678.5	572 540.1	727.1
443	7 394 689.6	572 530.6	727.2
444	7 394 701.4	572 534.9	728.7
445	7 394 710.6	572 530.5	729.4
446	7 394 717.5	572 510.1	729.0
447	7 394 716.8	572 540.5	733.0
448	7 394 703.3	572 573.8	733.5
449	7 394 692.9	572 581.1	733.1
450	7 394 685.1	572 596.9	733.0
451	7 394 685.1	572 614.0	733.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE NWS LANDFILL

FIGURE DYE-M.12

AECOM

13.2 Photographic Record

Photos 48 through 55

Photograph 48. View of the south berm of the landfill ↑

Photograph 49. Debris at the south berm of the landfill ↑

Photograph 50. Sedimentation along the ridge at the centre of the landfill ↑

Photograph 51. Sedimentation along the ridge in the landfill ↑

Photograph 52. Looking west from top centre of the landfill ↑

Photograph 53. **Looking east from the top centre of the landfill ↑**

Photograph 54. **Looking west from the top east portion of the landfill ↑**

Photograph 55. Overview of the east berm of the landfill ↑

13.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	Upper Site NWS Landfill
Date of Inspection:	10-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	Yes	Feature A - Areas of sedimentation observed in low area along centre of regrade	Areas; up to approximately 20 m	Areas; up to approximately 1 m		Less than 5%.		Pictures 050 and 051		Occasional	Acceptable
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	No									None	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Feature B - Steel cable observed at south end of landfill				Less Than 1%		Picture 049		Isolated	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	No									None	
Landfill Performance											Acceptable

DYE-M Cape Dyer
Upper Site NWS Landfill
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Acceptable	Occasional
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	Acceptable	

14. South Landfill - West

14.1 Visual Inspection

The South Landfill – West visual inspection was completed on August 10, 2014. The South Landfill - West is located 60 m south of the Upper Site NWS Landfill and occupies an area of approximately 6,800 m^2. It includes an asbestos landfill, which was completed in the 1990s. The landfill was covered with 0.75 m Type 2 granular fill over the surface of the landfill with a 0.5 m Type 1 ditch along the east side slope. The Visual Inspection Checklist/Report has been completed as per the Terms of Reference and is included below.

14.1.1 Settlement

Indications of settlement were not observed during the inspection.

14.1.2 Erosion

There were no erosion features observed during this inspection.

14.1.3 Frost Action

Frost action was not observed at the site.

14.1.4 Evidence of Burrowing Animals

Indications of burrowing animals were not observed.

14.1.5 Re-establishment of Vegetation

Areas of sparse vegetation were observed on the top surface of the landfill.

14.1.6 Staining

There was no staining noted during this inspection.

14.1.7 Seepage Points

Seepage was not noted at the landfill.

14.1.8 Debris

A piece of plywood was seen on the west side of the landfill and a piece of metal debris is located just north of the landfill. Neither piece of debris is suspected to have been located within the landfill contents.

14.1.9 Discussion

There only minor areas of settlement and no erosion issues noted and therefore, the landfill performance is rated as acceptable.

572 425 E
572 500 E
572 575 E
572 650 E
7 394 650 N
7 394 575 N
7 394 500 N

UPPER SITE NWS LANDFILL (REGRADED)
SOUTH LANDFILL–WEST (REGRADED)
ACCESS ROAD

DM–23
DM–24
DM–25
DM–26
DM–27
DM–28
DM–29
DM–30

METAL DEBRIS
SPARSE VEGETATION
PLYWOOD
LOW AREA
SPARSE VEGETATION

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 460 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (8)
- ⬭ — MONITORING SITE FEATURE
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT

SOUTH LANDFILL–WEST REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
460	7 394 578.0	572 454.4	712.2
461	7 394 612.9	572 495.9	719.0
462	7 394 628.8	572 532.8	724.1
463	7 394 632.2	572 549.7	725.5
464	7 394 622.5	572 568.1	725.1
465	7 394 613.0	572 604.2	725.0
466	7 394 603.5	572 626.1	724.3
467	7 394 566.8	572 627.0	720.5
468	7 394 573.3	572 586.9	720.7
469	7 394 572.3	572 584.7	720.6
470	7 394 561.0	572 582.4	718.9
471	7 394 560.1	572 569.8	718.3
472	7 394 567.6	572 569.6	719.5
473	7 394 565.8	572 541.4	718.8
474	7 394 561.5	572 539.1	718.2
475	7 394 548.8	572 538.5	717.0
476	7 394 559.3	572 522.5	716.9
477	7 394 548.9	572 494.5	713.5
478	7 394 528.6	572 488.5	711.2
479	7 394 533.2	572 473.0	710.8
480	7 394 532.9	572 448.0	707.6
481	7 394 534.6	572 446.4	707.4
482	7 394 536.8	572 460.6	709.9
483	7 394 538.9	572 464.8	710.5
484	7 394 557.7	572 462.1	711.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

SOUTH LANDFILL - WEST

FIGURE DYE-M.13

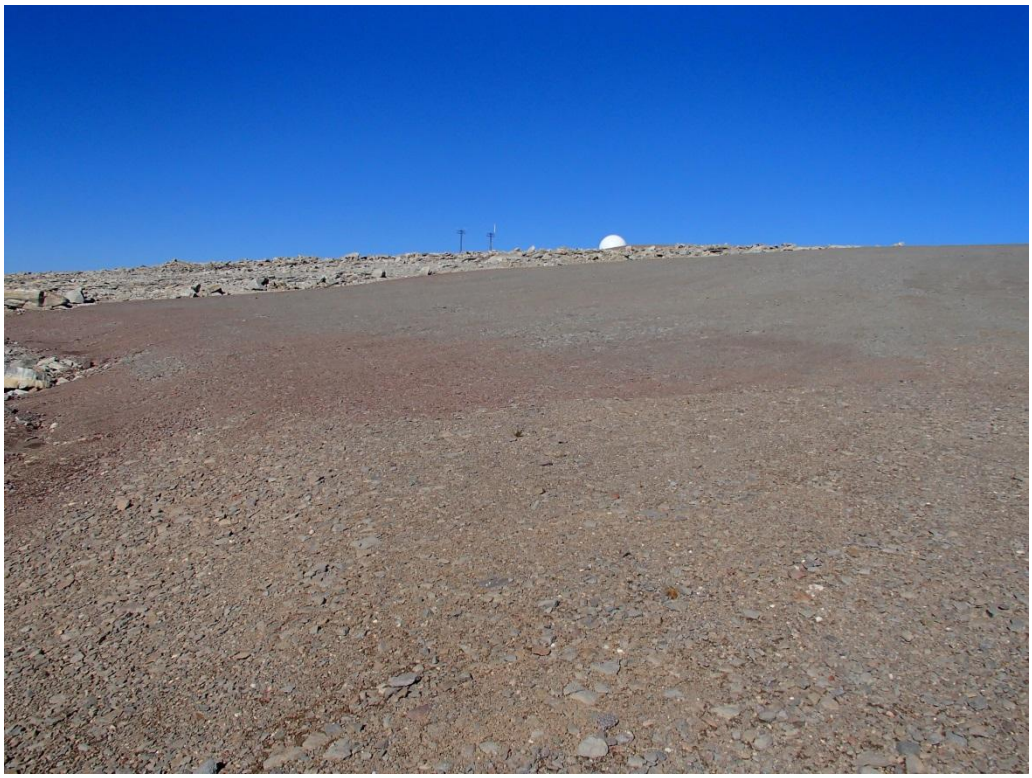
AECOM

14.2 Photographic Record

Photos 40 through 47

Photograph 40. Overview of the east portion of the south berm ↑

Photograph 41. **Looking east from the southwest corner ↑**



Photograph 42. **Looking north from the southwest corner of the landfill ↑**

Photograph 43. Vegetation on the surface of the landfill ↑

Photograph 44. Low spot and surface debris on the west side of the landfill ↑

Photograph 45. Looking south from the north-centre portion of the landfill ↑

Photograph 46. Vegetation on the surface of the landfill ↑

Photograph 47. Debris located between South Landfill – West and the Upper Site NWS Landfill ↑

14.3 Visual Inspection Checklist

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	DYE-M Cape Dyer
Landfill Designation:	South Landfill - West
Date of Inspection:	10-Aug-14
Inspected By:	Matt Lotecki
Report Prepared By:	Matt Lotecki
Report Reviewed By:	Roland Merkosky
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Feature A - Occasional individual pieces of vegetation were found on the top surface	Individual: up to 100 mm	Individual: up to 100 mm	Up to 100 mm tall	Extent of areas cover less than 1%		Pictures 43 and 46		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Feature B - Plywood observed at West end of landfill. Metal debris north of the landfill				Less Than 1%		Picture 044		Isolated	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	No	Feature C - One small low area on the West end fo the landfill				Less Than 1%				Isolated	Acceptable
Landfill Performance											Acceptable

DYE-M Cape Dyer
South Landfill - West
Preliminary Stability Assessment

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	Acceptable	

15. Summary

As observed during the 2014 Landfill Monitoring event at DYE M, all 12 landfills were performing at an acceptable level. The landfills that were constructed earlier in the remediation program have some vegetation starting to grow on the side slopes and top surface. All observations noted were considered to be very minor and there is no evidence of issues of potential concern.

Appendix A

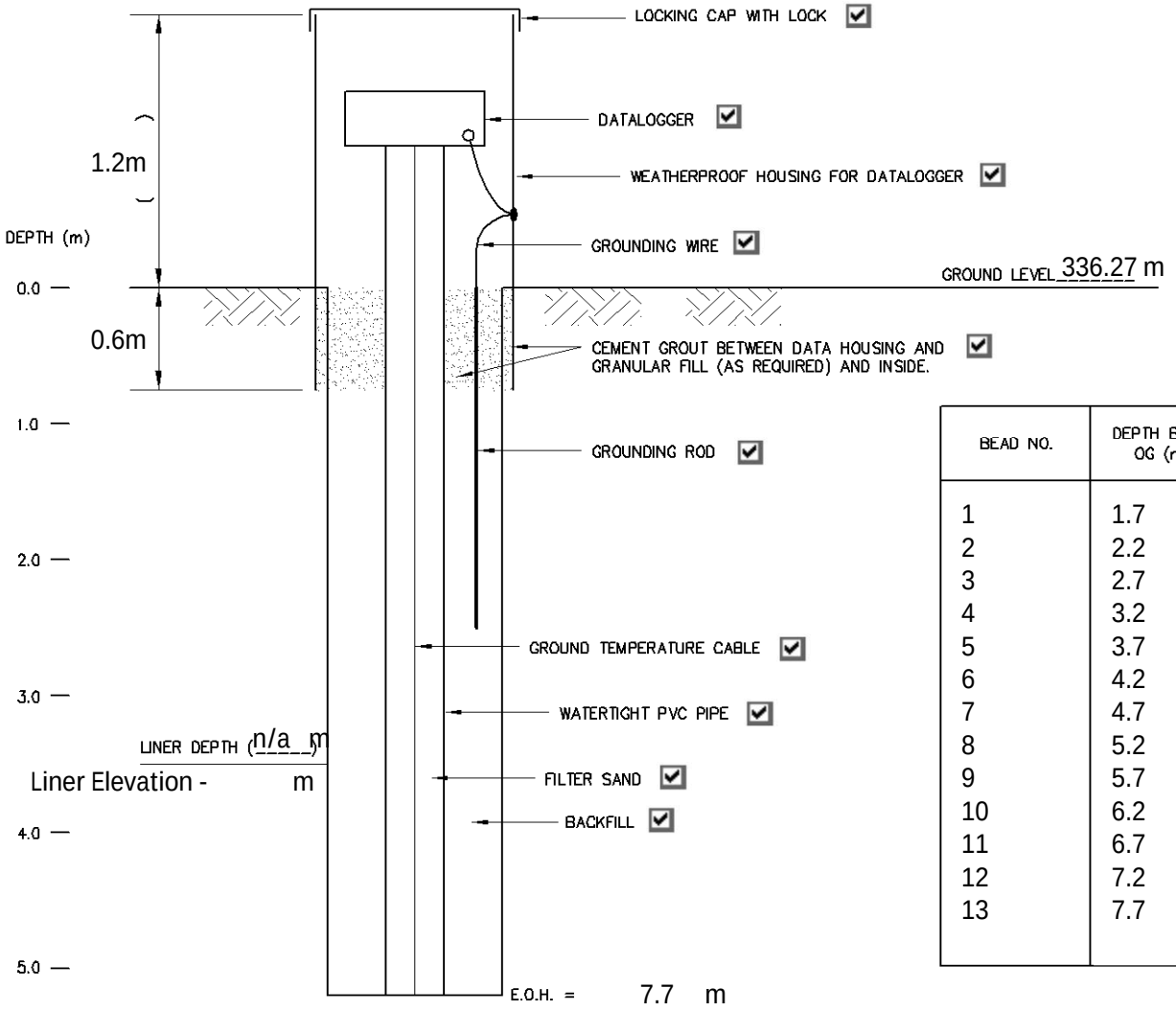
Thermistor Installation Logs

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - LS Tier II

LOCATION: NORTHING 7388321.9
GROUND ELEVATION: 336.27
CABLE LENGTH: 9.7m
CABLE LENGTH ABOVE GROUND: 2.0m
NUMBER OF BEADS: 13

CABLE INSTALLATION NO.: VT-1
CABLE SERIAL NO.: 07110005
EASTING 561880.9
DATE: August 30, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 334.57m
HOLE DEPTH: 7.7m



BEAD NO.	DEPTH BELOW OG (m)
1	1.7
2	2.2
3	2.7
4	3.2
5	3.7
6	4.2
7	4.7
8	5.2
9	5.7
10	6.2
11	6.7
12	7.2
13	7.7

Bottom of Key Trench
Elevation = 328.53m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date - June 2017

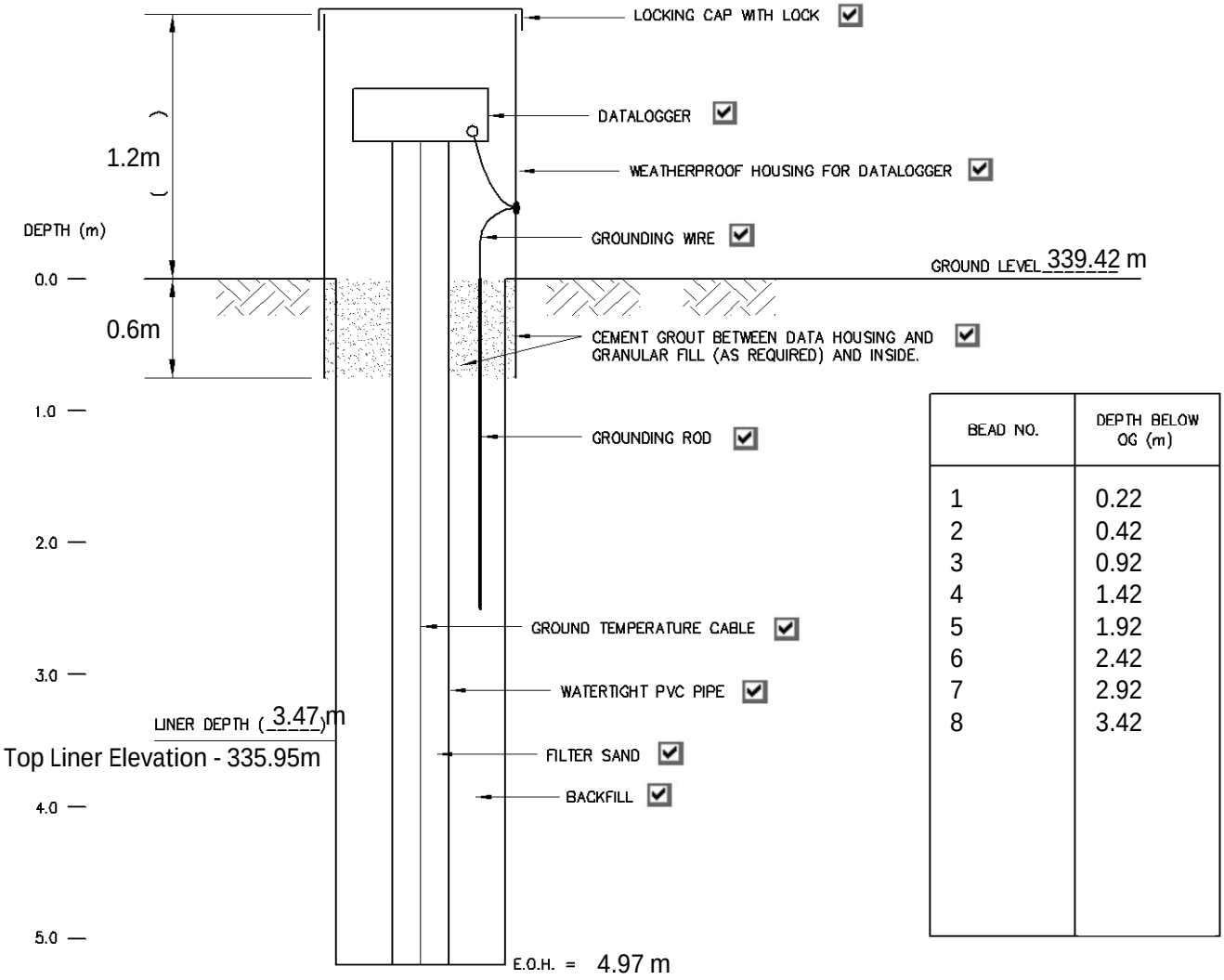
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - LS Tier II

LOCATION: NORTHING 7388235.5
GROUND ELEVATION: 339.42 m
CABLE LENGTH: 6.2m
CABLE LENGTH ABOVE GROUND: 2.78m
NUMBER OF BEADS: 8

CABLE INSTALLATION NO.: VT-2
CABLE SERIAL NO.: 07110052
EASTING 561836.6
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 339.2m
HOLE DEPTH: 4.97m



BEAD NO.	DEPTH BELOW OG (m)
1	0.22
2	0.42
3	0.92
4	1.42
5	1.92
6	2.42
7	2.92
8	3.42

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date June 2017
Bottom Liner Elevation - 333.45m

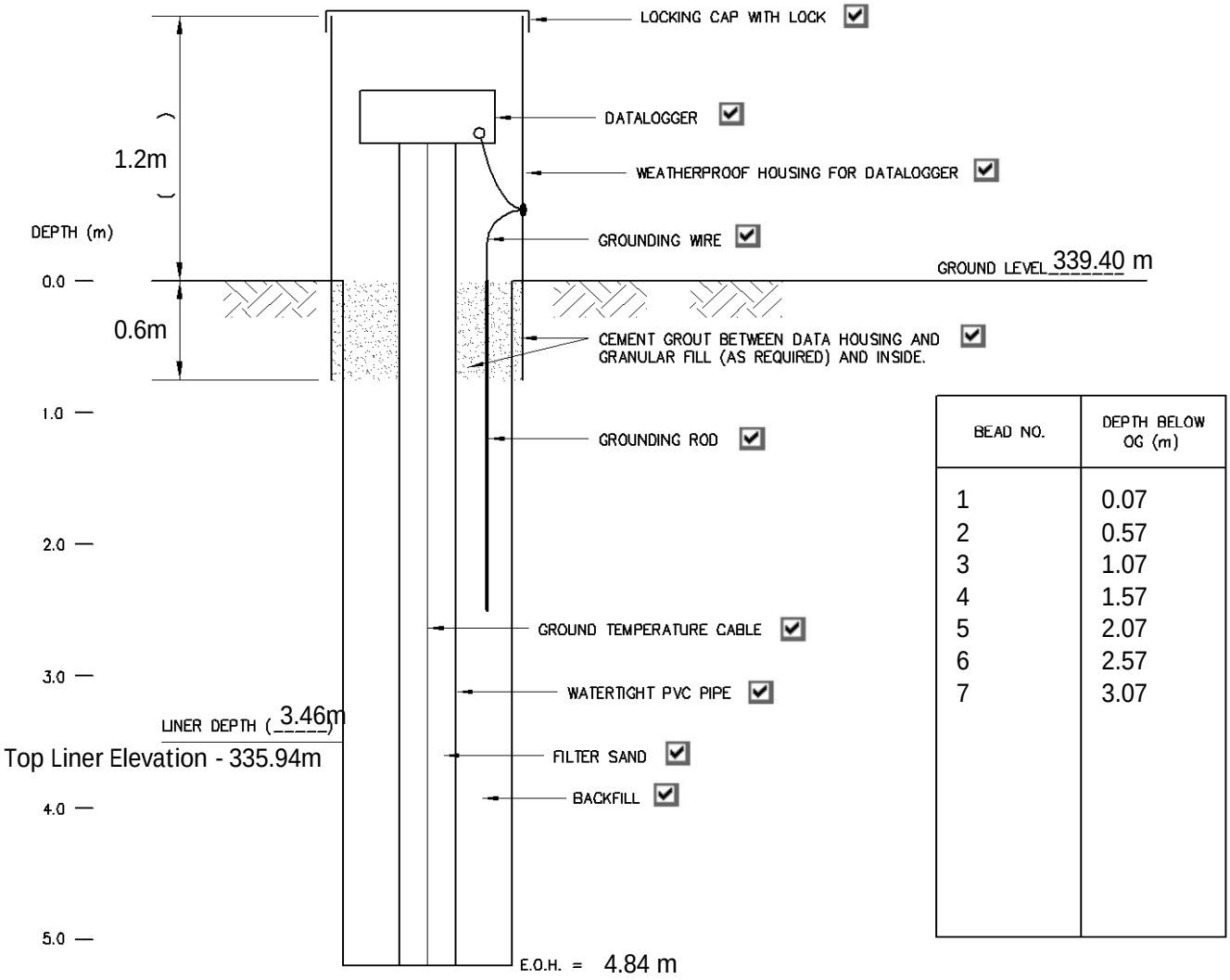
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - LS Tier II

LOCATION: NORTHING 7388281.8
GROUND ELEVATION: 339.40m
CABLE LENGTH: 6.0m
CABLE LENGTH ABOVE GROUND: 2.93m
NUMBER OF BEADS: 7

CABLE INSTALLATION NO.: VT-3
CABLE SERIAL NO.: 07110053
EASTING 561927.1
DATE: August 30, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 339.33m
HOLE DEPTH: 4.84m



BEAD NO.	DEPTH BELOW OG (m)
1	0.07
2	0.57
3	1.07
4	1.57
5	2.07
6	2.57
7	3.07

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date June 2017
Botton Liner Elevation - 333.56 m

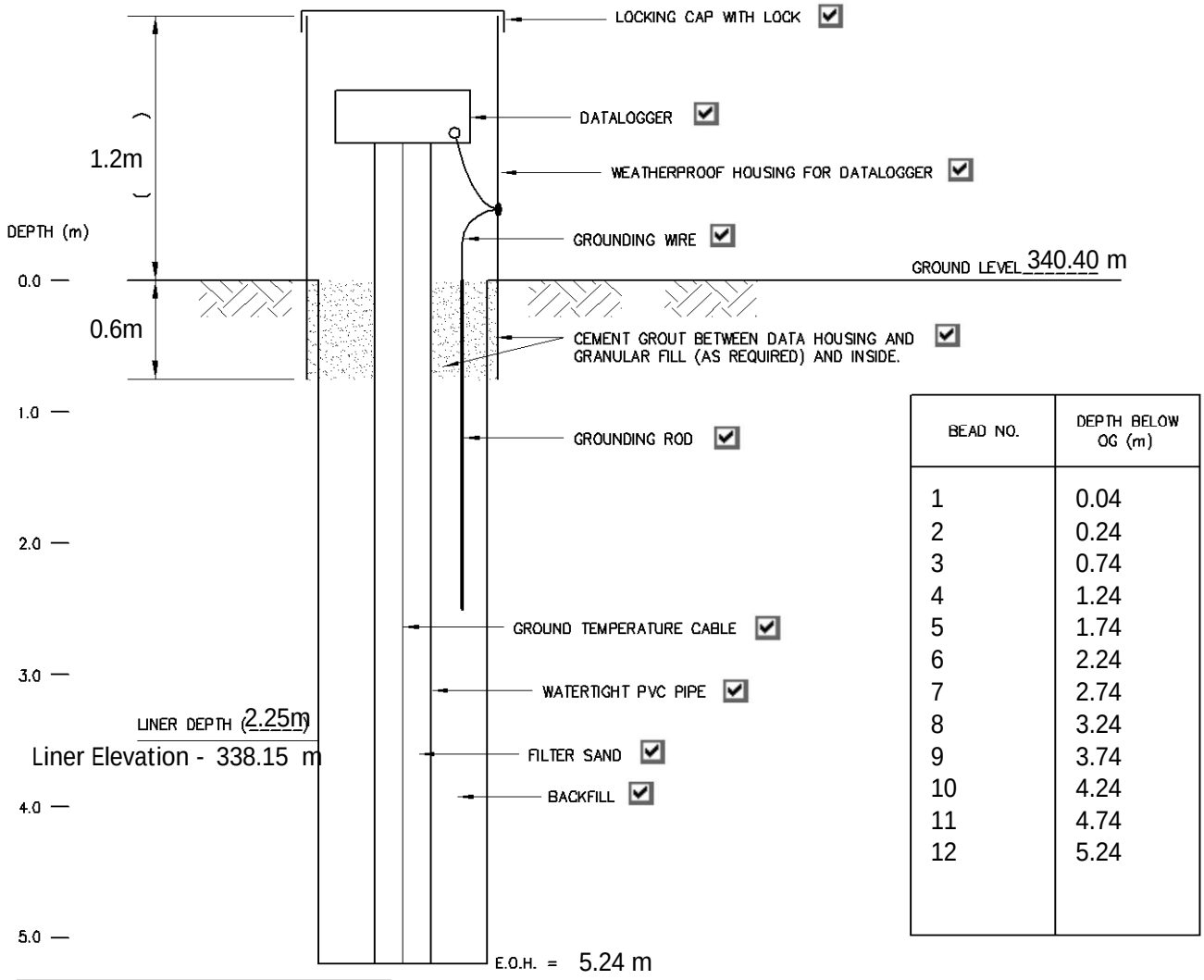
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - LS Tier II

LOCATION: NORTHING 7388184.4
GROUND ELEVATION: 340.40m
CABLE LENGTH: 8.2m
CABLE LENGTH ABOVE GROUND: 2.96m
NUMBER OF BEADS: 12

CABLE INSTALLATION NO.: VT-4
CABLE SERIAL NO.: 07110055
EASTING 561861.4
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 340.36m
HOLE DEPTH: 5.24m



BEAD NO.	DEPTH BELOW OG (m)
1	0.04
2	0.24
3	0.74
4	1.24
5	1.74
6	2.24
7	2.74
8	3.24
9	3.74
10	4.24
11	4.74
12	5.24

Bottom of Key Trench
Elevation = 334.60m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

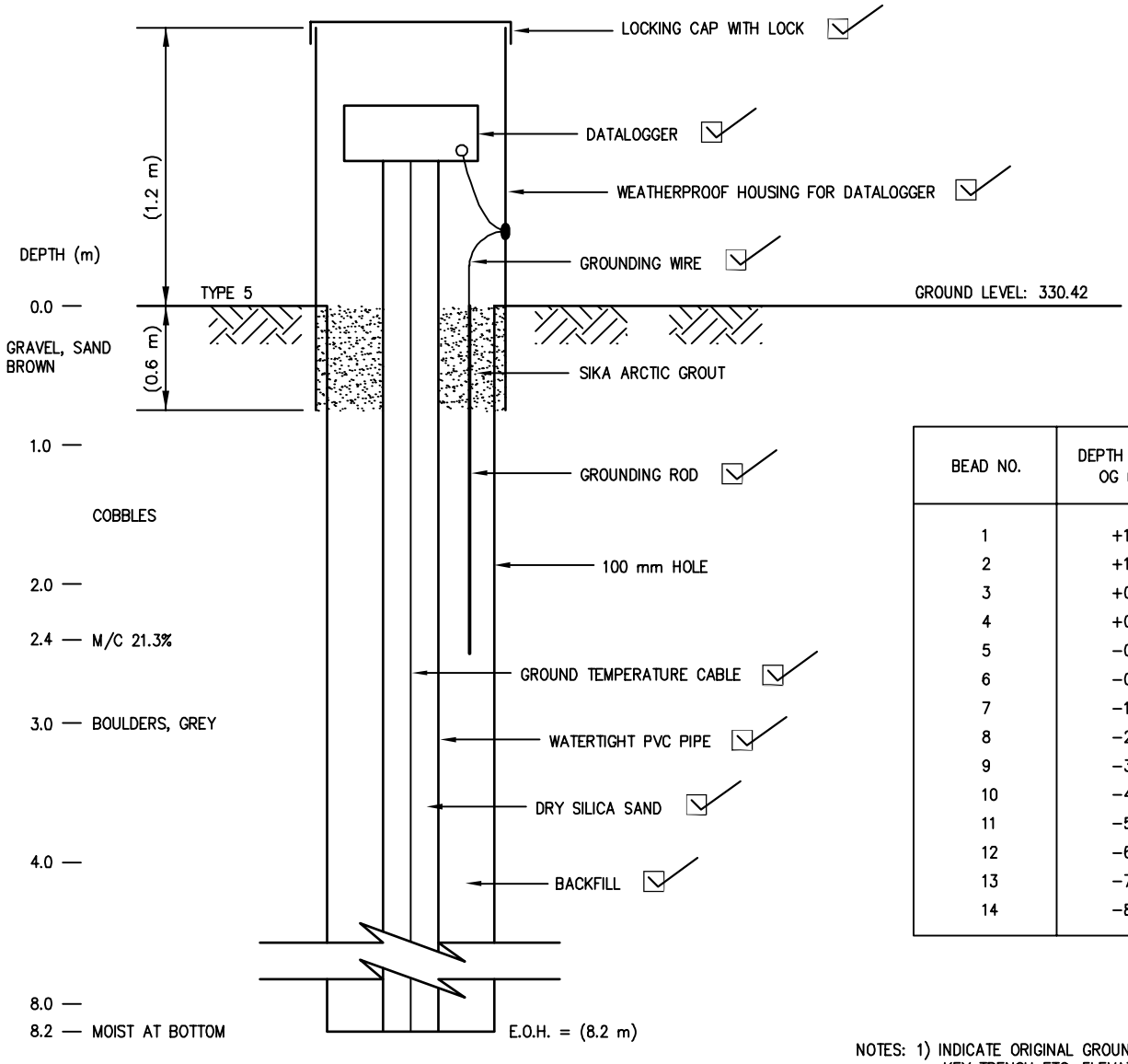
Note: Battery Expiry Date - June 2017

AECOM

SITE: DYE-M LS TIER II

LOCATION: NORTHING 7388226.42
GROUND ELEVATION: 330.42
CABLE LENGTH: 12 m
CABLE LENGTH ABOVE GROUND: 3.8 m
NUMBER OF BEADS: 14

CABLE INSTALLATION NO.: VT-BL
CABLE SERIAL NO.: DYE-M-LOWER
EASTING 561628.39
DATE: SEPTEMBER 13, 2008
LEAD LENGTH: 2 m
1ST BEAD ELEVATION: +1.8 m
HOLE DEPTH: 8.2 m
LOGGER 07110027



BEAD NO.	DEPTH BELOW OG (m)
1	+1.8
2	+1.3
3	+0.8
4	+0.3
5	−0.2
6	−0.7
7	−1.2
8	−2.2
9	−3.2
10	−4.2
11	−5.2
12	−6.2
13	−7.2
14	−8.2

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

CLIENT

DEW Line Clean Up Project
Dye-M

Ground Temperature Cable Installation Report

EBA Engineering Consultants Ltd.

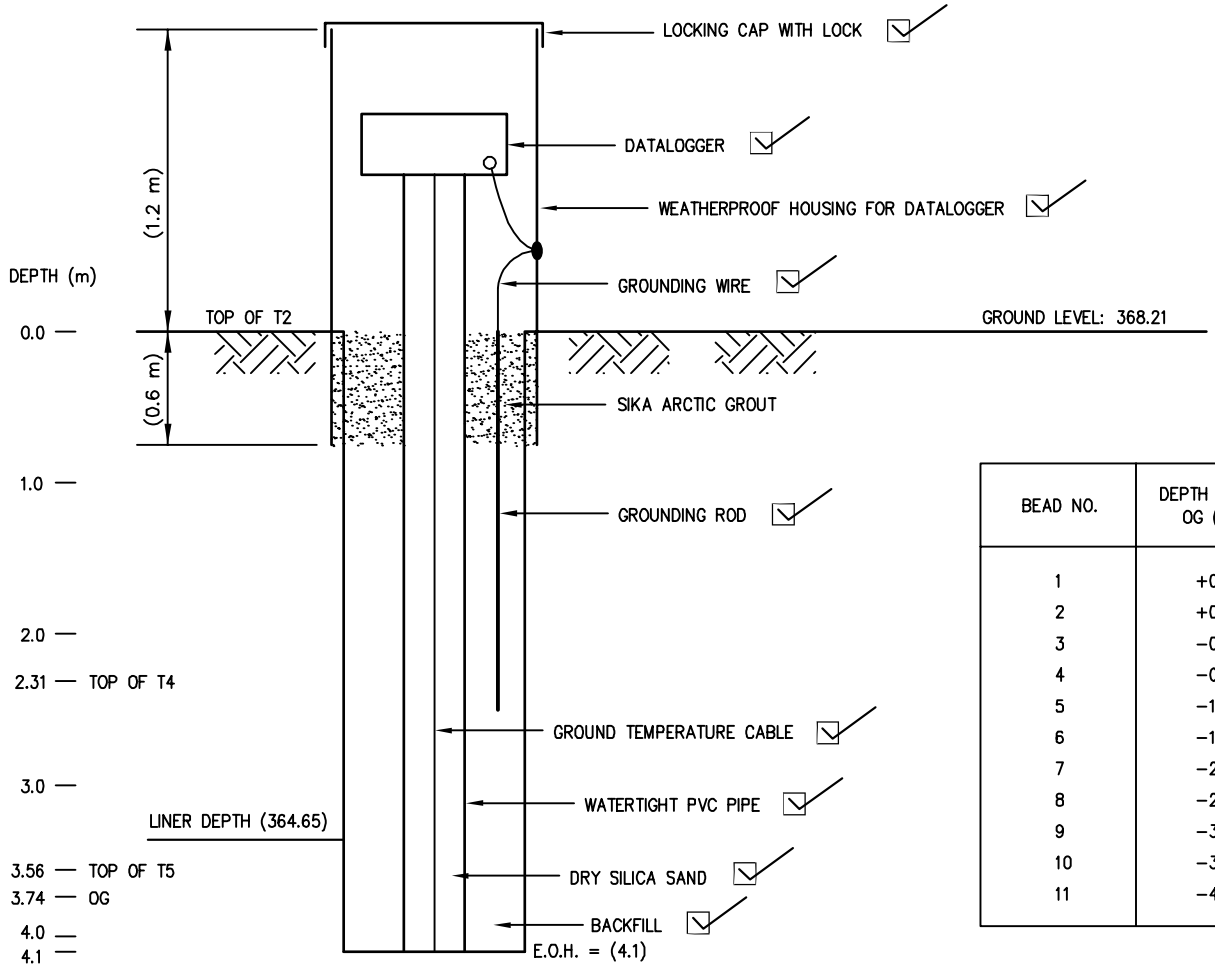
PROJECT NO.	DWN	CKD	REV
10995027.008	DBD	GK	0
OFFICE: EDM	DATE: October 10, 2008		

VT-BL

SITE: DYE-M POWERHOUSE LANDFILL

LOCATION: NORTHING 7387478.14
GROUND ELEVATION: 368.21
CABLE LENGTH: 8.1 m
CABLE LENGTH ABOVE GROUND: 4.0 m
NUMBER OF BEADS: 11

CABLE INSTALLATION NO.: VT-5
CABLE SERIAL NO.: VT-5
EASTING 562757.63
DATE: SEPTEMBER 15, 2008
LEAD LENGTH: 3.2 m
1ST BEAD ELEVATION: +0.8 m
HOLE DEPTH: 4.10 m
LOGGER 07110024



BEAD NO.	DEPTH BELOW OG (m)
1	+0.8
2	+0.4
3	−0.1
4	−0.6
5	−1.1
6	−1.6
7	−2.1
8	−2.6
9	−3.1
10	−3.6
11	−4.1

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

CLIENT

DEW Line Clean Up Project
Dye-M

Ground Temperature Cable Installation Report

EBA Engineering Consultants Ltd.

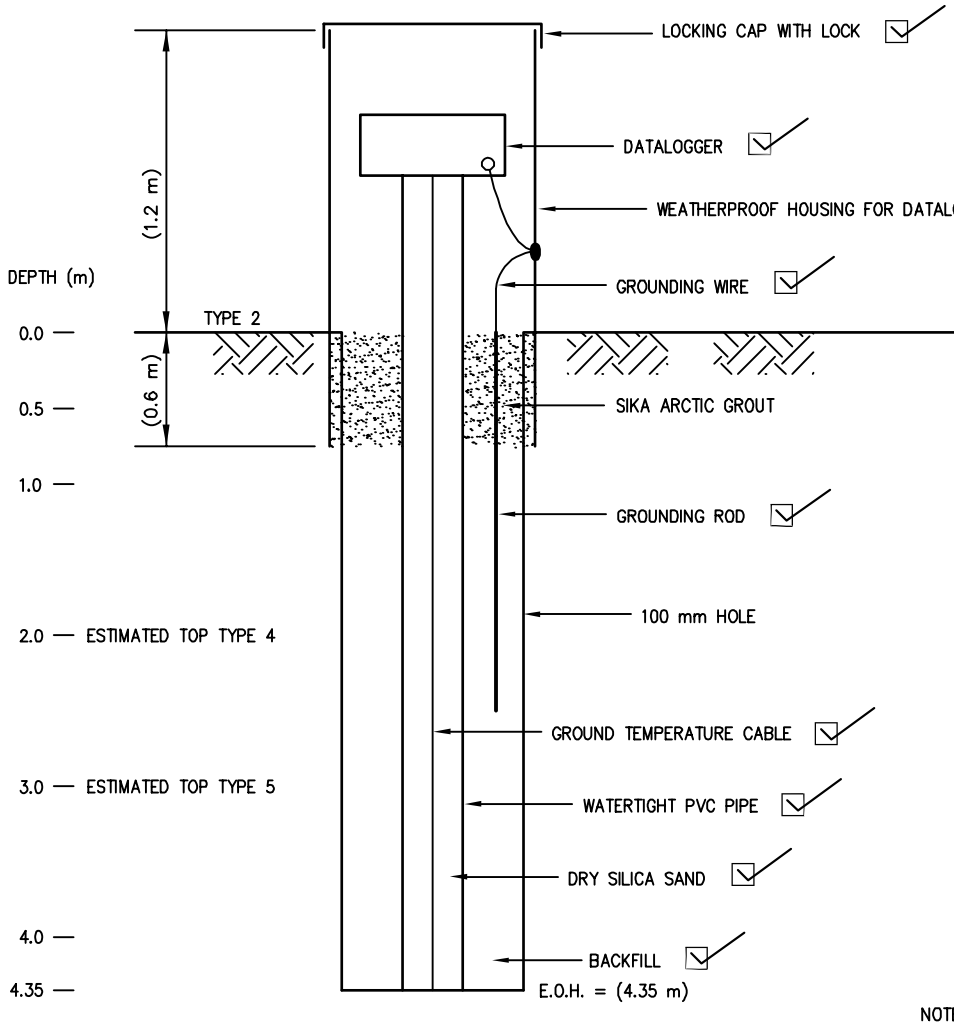
PROJECT NO.	DWN	CKD	REV
10995027.008	DBD	GK	0
OFFICE: EDM	DATE: October 10, 2008		

VT-5

SITE: DYE–M POWERHOUSE LANDFILL

LOCATION: NORTHING 7387454.35
GROUND ELEVATION: 369.60
CABLE LENGTH: 7.7 m
CABLE LENGTH ABOVE GROUND: 3.35
NUMBER OF BEADS: 10

CABLE INSTALLATION NO.: VT–6
CABLE SERIAL NO.: VT–6
EASTING 562755.43
DATE: SEPTEMBER 11, 2008
LEAD LENGTH: 3.2 m
1ST BEAD ELEVATION: +0.15 m
HOLE DEPTH: 4.35 m
LOGGER 07110025



BEAD NO.	DEPTH BELOW OG (m)
1	+0.15
2	−0.35
3	−0.85
4	−1.35
5	−1.85
6	−2.35
7	−2.85
8	−3.35
9	−3.85
10	−4.35

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

CLIENT

DEW Line Clean Up Project
Dye-M

Ground Temperature Cable Installation Report

EBA Engineering Consultants Ltd.

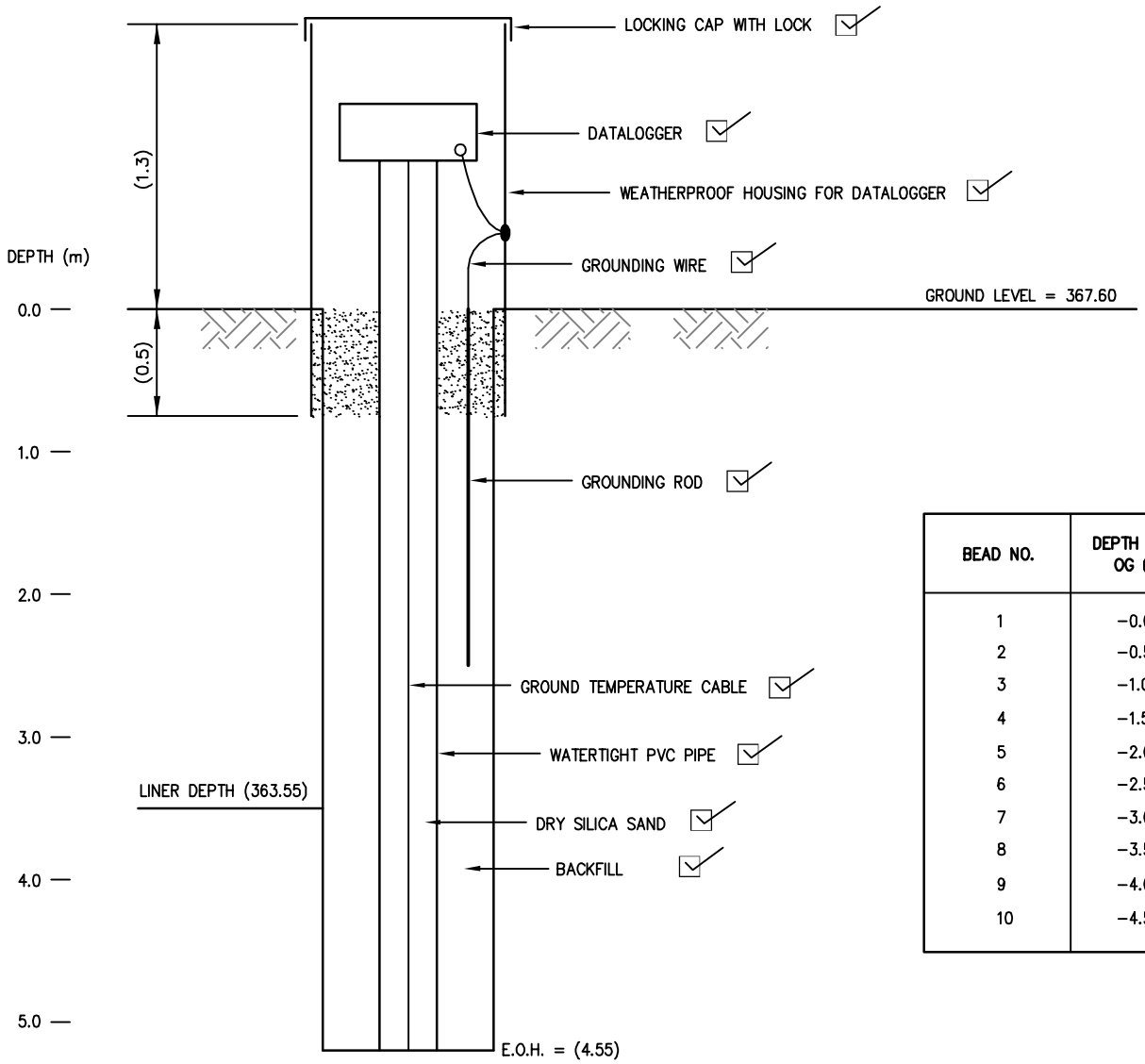
PROJECT NO.	DWN	CKD	REV
10995027.008	DBD	GK	0
OFFICE: EDM	DATE: October 10, 2008		

VT-6

SITE: POWERHOUSE LANDFILL

LOCATION: NORTHING 7,387,448.889
GROUND ELEVATION: 367.60
CABLE LENGTH: 7.7
CABLE LENGTH ABOVE GROUND: 3.15
NUMBER OF BEADS: 10

CABLE INSTALLATION NO.: VT-7
CABLE SERIAL NO.: VT-7
EASTING 562,789.511
DATE: JULY 14, 2009
LEAD LENGTH: 3.2
1ST BEAD ELEVATION: -0.5
HOLE DEPTH: 4.55
HOLE DIA.: 5"
DATA LOGGER: 07110026



BEAD NO.	DEPTH BELOW OG (m)
1	−0.05
2	−0.55
3	−1.05
4	−1.55
5	−2.05
6	−2.55
7	−3.05
8	−3.55
9	−4.05
10	−4.55

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

CLIENT
AECOM

DYE-M DEW Line Clean Up Project
Cape Dyer, Nunavut

Ground Temperature Cable Installation Report
VT-7

EBA Engineering Consultants Ltd.

PROJECT NO./FILE NO.	DWN	CKD	REV
10995027.009	DBD	RK	0
OFFICE: EBA-EDM	DATE: October 2009		

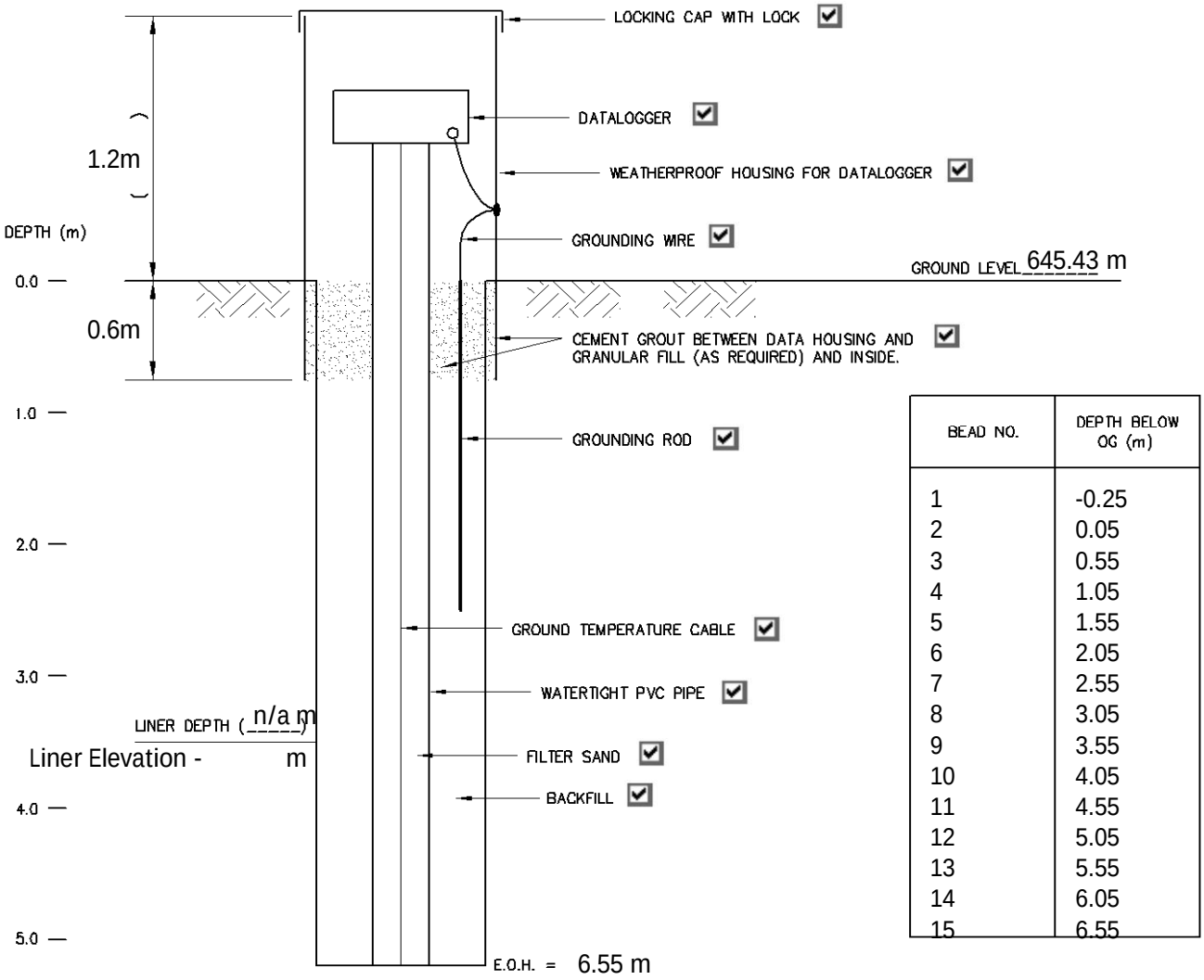
VT-7

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - US Tier II

LOCATION: NORTHING 7394615.5
GROUND ELEVATION: 645.43m
CABLE LENGTH: 9.8m
CABLE LENGTH ABOVE GROUND: 3.25m
NUMBER OF BEADS: 15

CABLE INSTALLATION NO.: VT-8
CABLE SERIAL NO.: 07110057
EASTING 571051.5
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 645.68m
HOLE DEPTH: 6.55m



BEAD NO.	DEPTH BELOW OG (m)
1	-0.25
2	0.05
3	0.55
4	1.05
5	1.55
6	2.05
7	2.55
8	3.05
9	3.55
10	4.05
11	4.55
12	5.05
13	5.55
14	6.05
15	6.55

Bottom of Key Trench
Elevation = 638.42m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date - June 2017

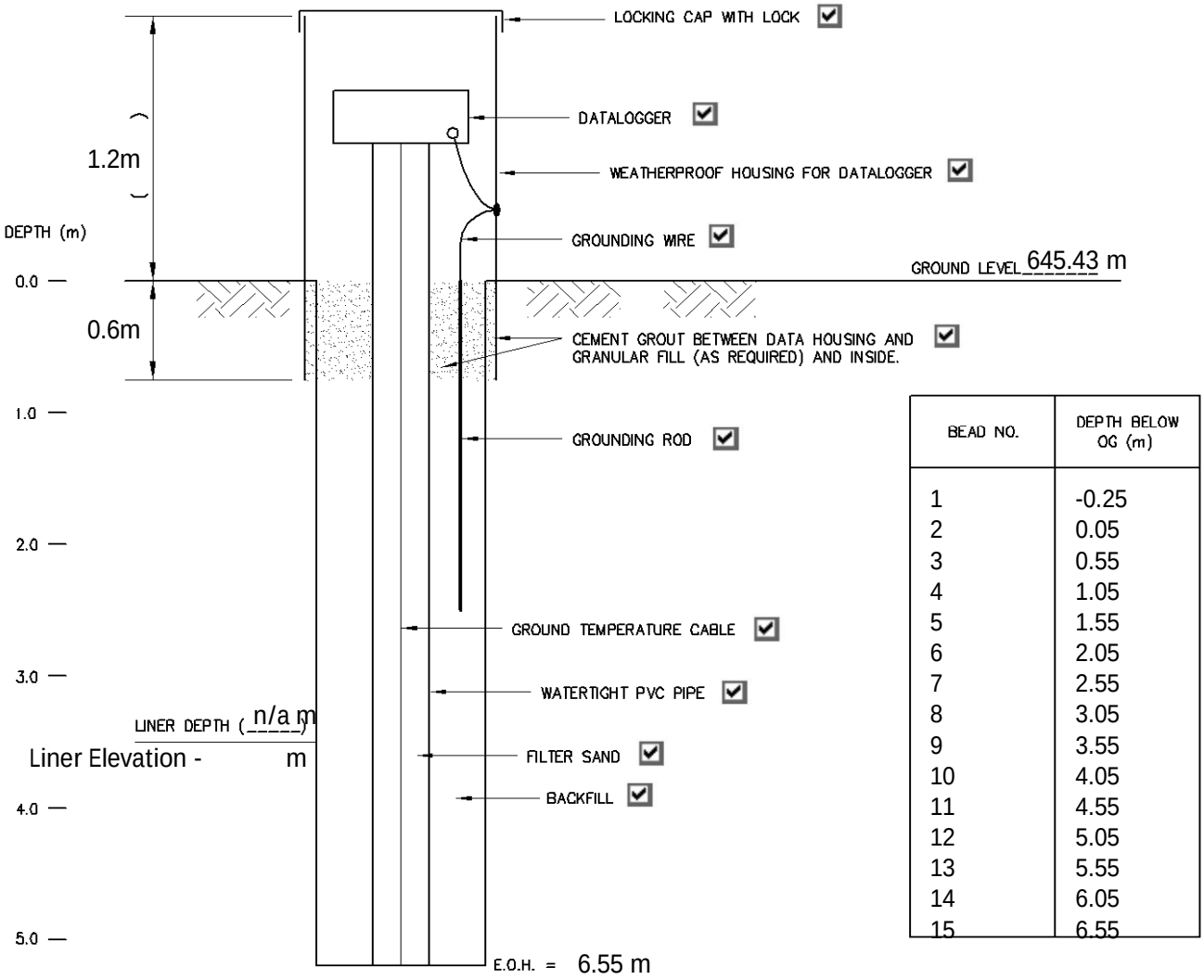
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - US Tier II

LOCATION: NORTHING 7394615.5
GROUND ELEVATION: 645.43m
CABLE LENGTH: 9.8m
CABLE LENGTH ABOVE GROUND: 3.25m
NUMBER OF BEADS: 15

CABLE INSTALLATION NO.: VT-8
CABLE SERIAL NO.: 07110057
EASTING 571051.5
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 645.68m
HOLE DEPTH: 6.55m



BEAD NO.	DEPTH BELOW OG (m)
1	-0.25
2	0.05
3	0.55
4	1.05
5	1.55
6	2.05
7	2.55
8	3.05
9	3.55
10	4.05
11	4.55
12	5.05
13	5.55
14	6.05
15	6.55

Bottom of Key Trench
Elevation = 638.42m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date - June 2017

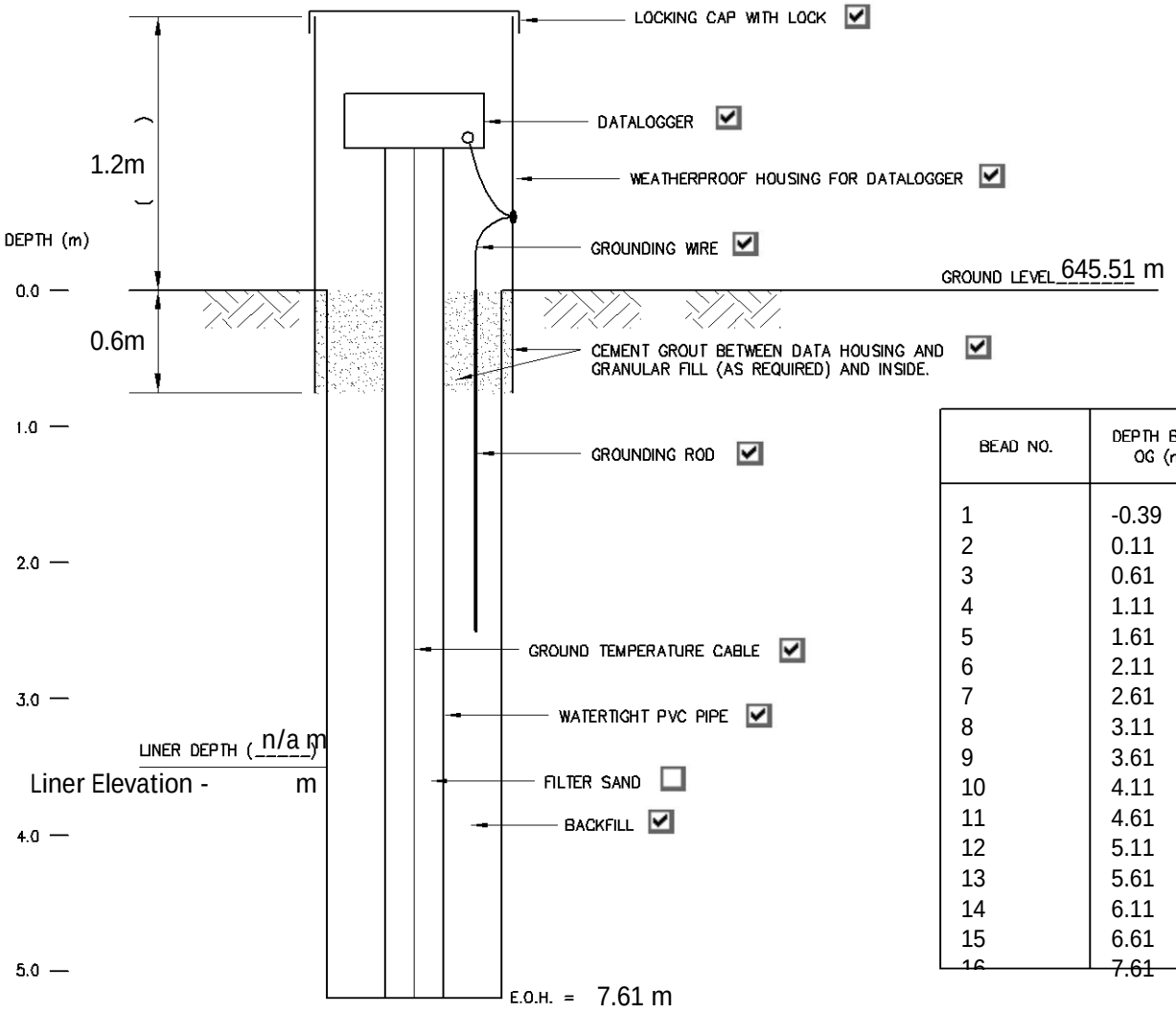
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - US Tier II

LOCATION: NORTHING 7394558.0
GROUND ELEVATION: 645.51m
CABLE LENGTH: 11.0m
CABLE LENGTH ABOVE GROUND: 3.39m
NUMBER OF BEADS: 16

CABLE INSTALLATION NO.: VT-9
CABLE SERIAL NO.: 07110058
EASTING 571088.7
DATE: August 29, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 645.90m
HOLE DEPTH: 7.61m



BEAD NO.	DEPTH BELOW OG (m)
1	-0.39
2	0.11
3	0.61
4	1.11
5	1.61
6	2.11
7	2.61
8	3.11
9	3.61
10	4.11
11	4.61
12	5.11
13	5.61
14	6.11
15	6.61
16	7.61

Bottom of Key Trench
Elevation = 637.44m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date - June 2017
PVC pipe containing cable backfilled with grout instead of filter sand.

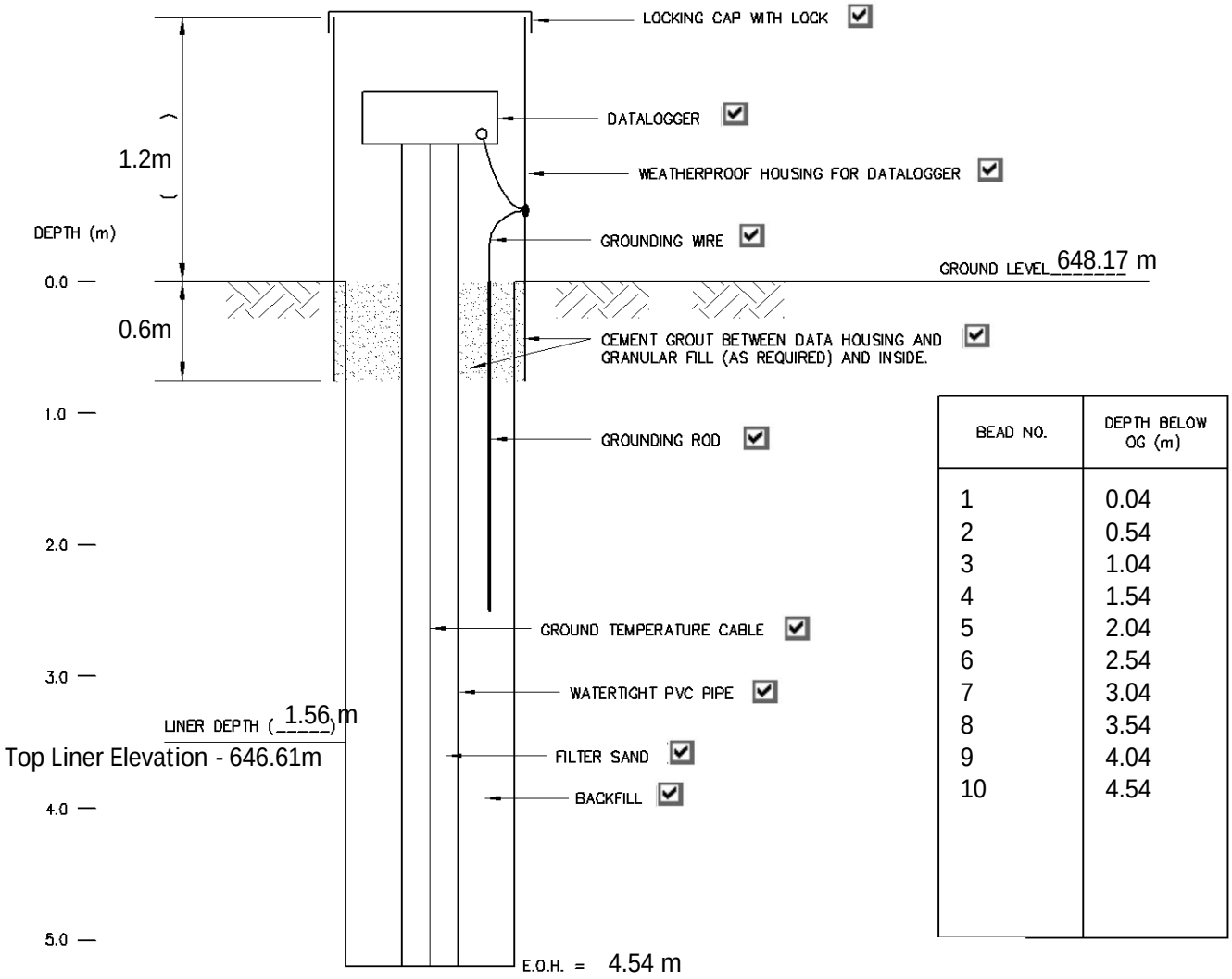
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - US Tier II

LOCATION: NORTHING 7394608.9
GROUND ELEVATION: 648.17m
CABLE LENGTH: 7.5m
CABLE LENGTH ABOVE GROUND: 2.96m
NUMBER OF BEADS: 10

CABLE INSTALLATION NO.: VT-10
CABLE SERIAL NO.: 07110059
EASTING 571120.9
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 648.13m
HOLE DEPTH: 4.54m



BEAD NO.	DEPTH BELOW OG (m)
1	0.04
2	0.54
3	1.04
4	1.54
5	2.04
6	2.54
7	3.04
8	3.54
9	4.04
10	4.54

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

Note: Battery Expiry Date - June 2017
Bottom Liner Elevation - 642.61m

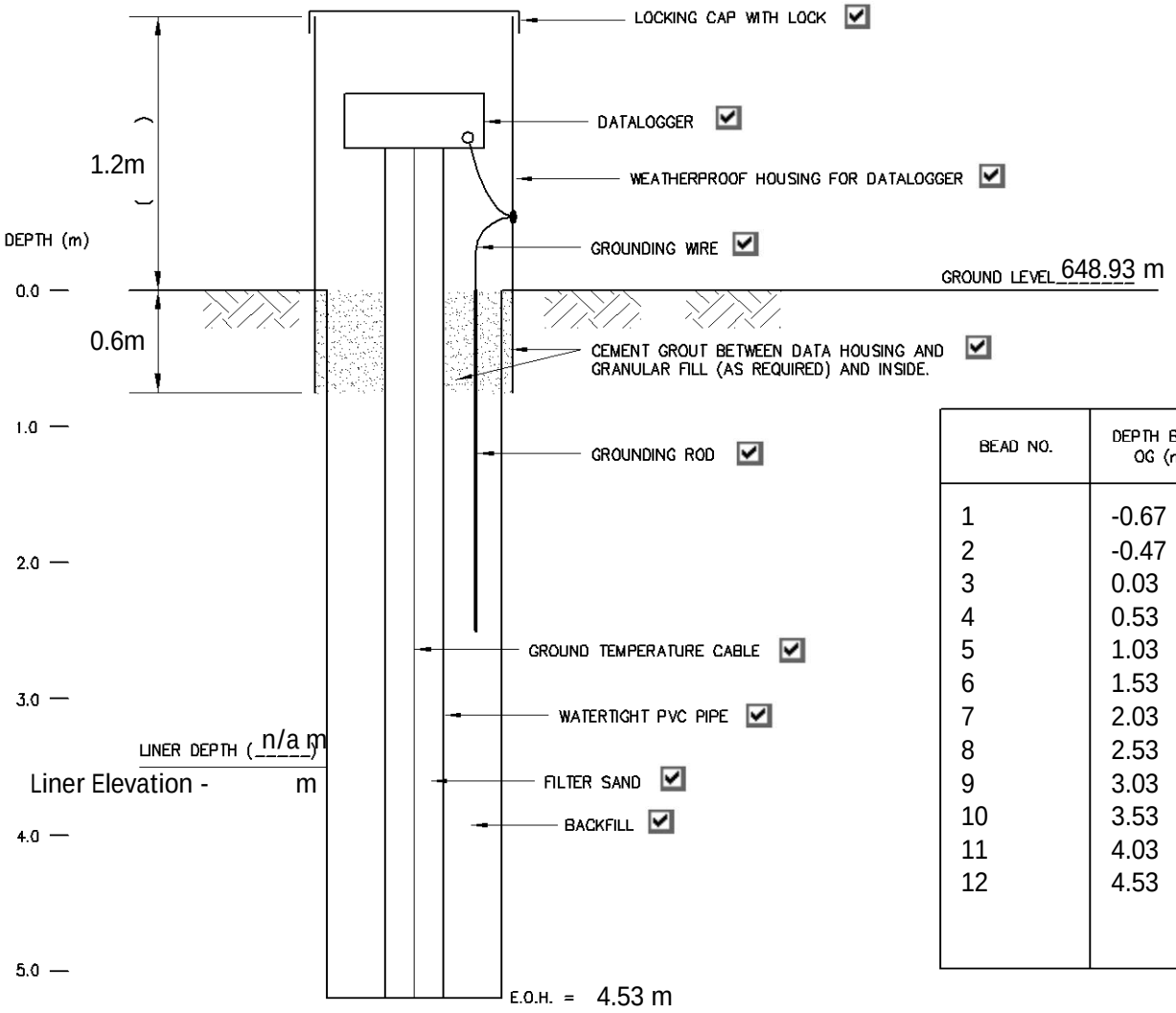
AECOM

GROUND TEMPERATURE CABLE INSTALLATION REPORT

SITE: DYE-M Cape Dyer - US Tier II

LOCATION: NORTHING 7394655.5
GROUND ELEVATION: 648.9m
CABLE LENGTH: 8.2m
CABLE LENGTH ABOVE GROUND: 3.67m
NUMBER OF BEADS: 12

CABLE INSTALLATION NO.: VT-11
CABLE SERIAL NO.: 07110051
EASTING 571132.2
DATE: August 14, 2013
LEAD LENGTH: 3.0m
1ST BEAD ELEVATION: 649.60m
HOLE DEPTH: 4.53m



BEAD NO.	DEPTH BELOW OG (m)
1	-0.67
2	-0.47
3	0.03
4	0.53
5	1.03
6	1.53
7	2.03
8	2.53
9	3.03
10	3.53
11	4.03
12	4.53

Bottom of Key Trench Elevation = 643.94m

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

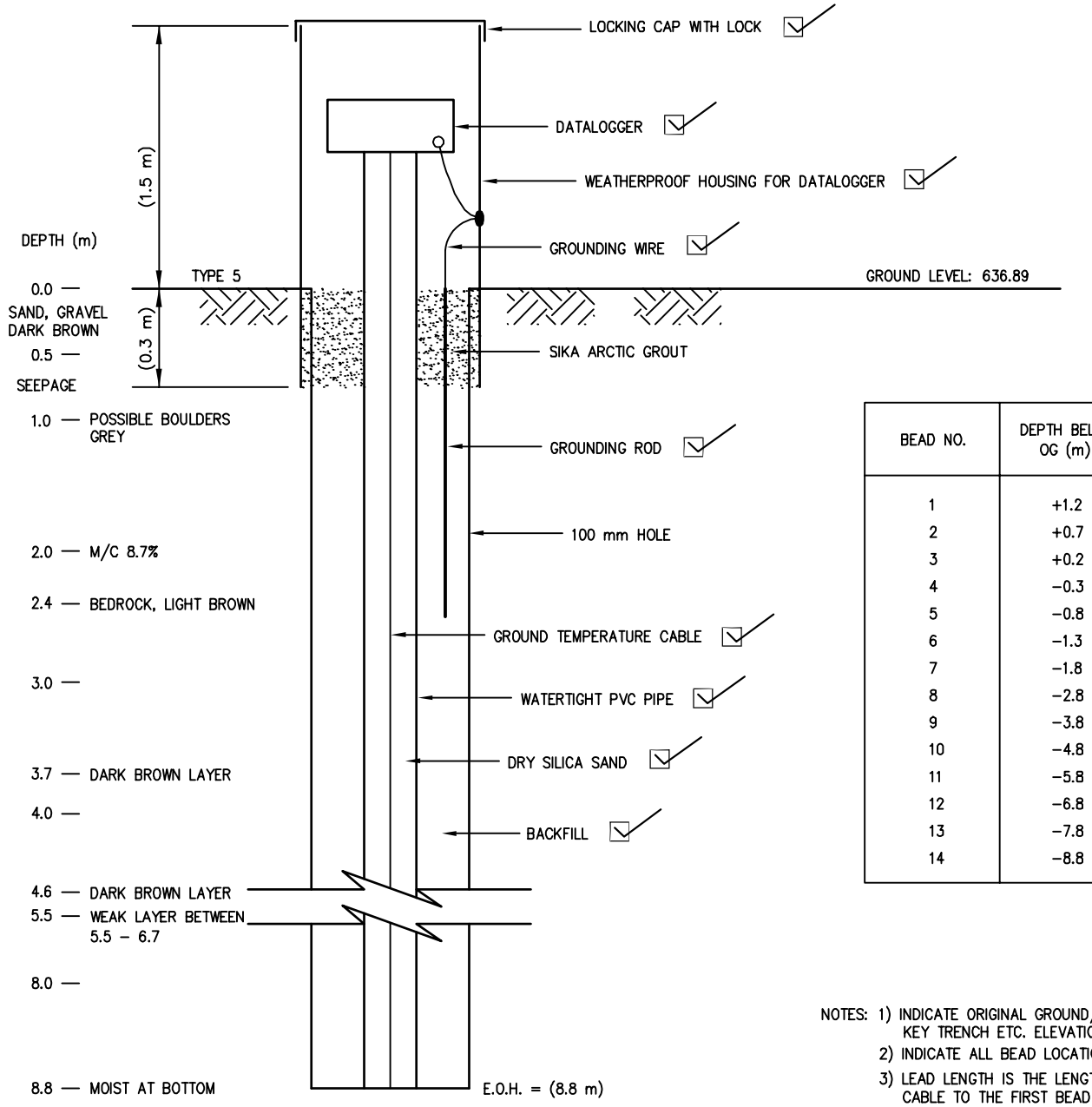
Note: Battery Expiry Date - June 2017

AECOM

SITE: DYE-M US TIER II

LOCATION: NORTHING 7394470.81
GROUND ELEVATION: 636.89
CABLE LENGTH: 12 m
CABLE LENGTH ABOVE GROUND: 3.2
NUMBER OF BEADS: 14

CABLE INSTALLATION NO.: VT-BU
CABLE SERIAL NO.: DYE-M-LOWER
EASTING 571142.64
DATE: SEPTEMBER 12, 2008
LEAD LENGTH: 2 m
1ST BEAD ELEVATION: +1.2 m
HOLE DEPTH: 8.8 m
LOGGER 07110028



BEAD NO.	DEPTH BELOW OG (m)
1	+1.2
2	+0.7
3	+0.2
4	-0.3
5	-0.8
6	-1.3
7	-1.8
8	-2.8
9	-3.8
10	-4.8
11	-5.8
12	-6.8
13	-7.8
14	-8.8

NOTES: 1) INDICATE ORIGINAL GROUND/LINER/ KEY TRENCH ETC. ELEVATIONS
2) INDICATE ALL BEAD LOCATIONS
3) LEAD LENGTH IS THE LENGTH OF CABLE TO THE FIRST BEAD

CLIENT

DEW Line Clean Up Project
Dye-M

Ground Temperature Cable Installation Report

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
10995027.008	DBD	GK	0
OFFICE: EDM	DATE: October 10, 2008		

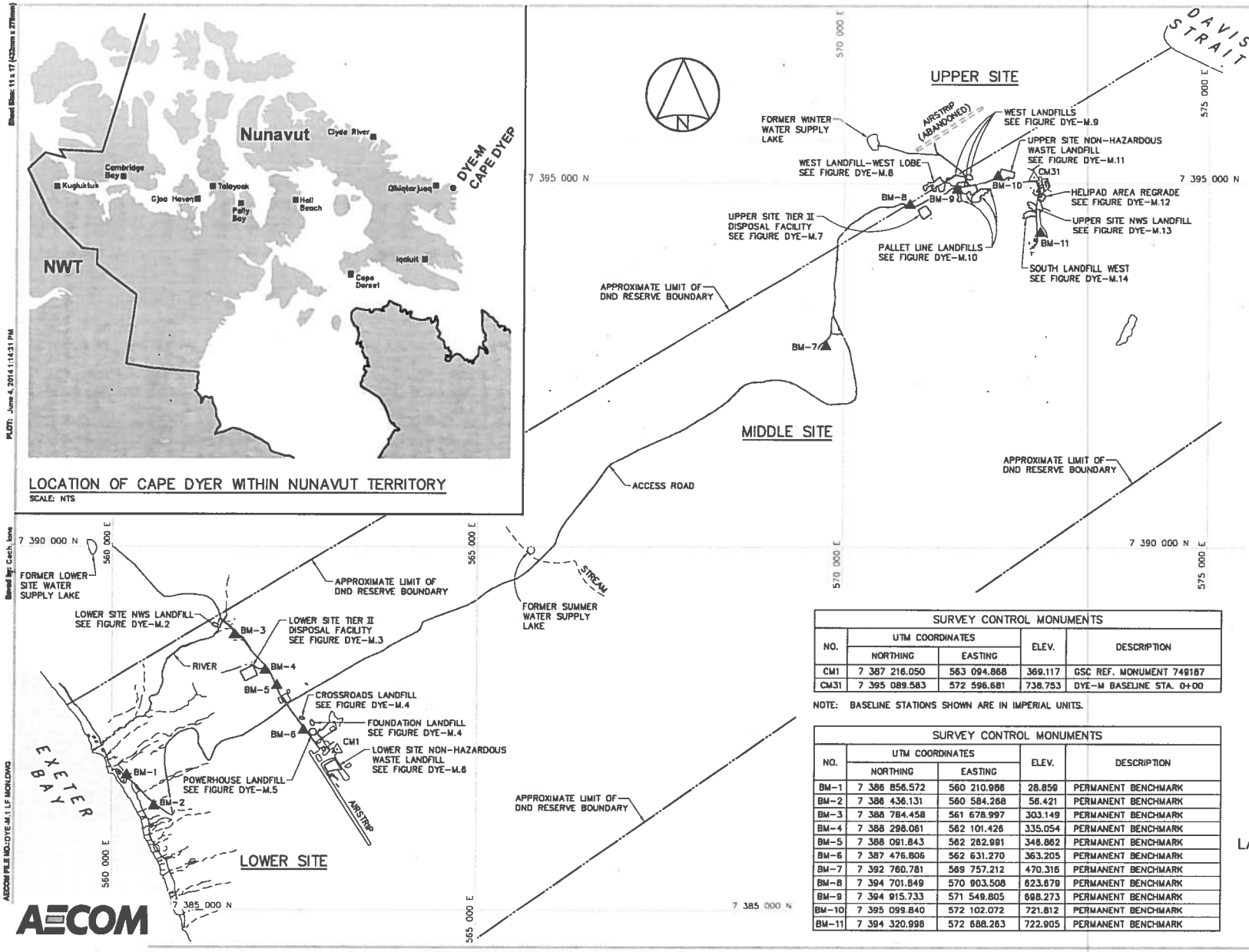
VT-BU

Appendix B

Field Notes

LOCATION OF CAPE DYER WITHIN NUNAVUT TERRITORY

SCALE: NTS



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- CM1 — SURVEY CONTROL MONUMENT (2)
- BM-1 — PERMANENT BENCHMARK LOCATION (11)
- ARCHAEOLOGICAL FEATURES
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- BODY OF WATER

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM1	7 387 216.050	563 094.868	369.117	GSC REF. MONUMENT 749187
CM31	7 395 089.583	572 596.681	738.753	DYE-M BASELINE STA. 0+00

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-1	7 386 856.572	560 210.988	28.859	PERMANENT BENCHMARK
BM-2	7 386 436.131	560 584.268	56.421	PERMANENT BENCHMARK
BM-3	7 388 784.458	561 678.997	303.149	PERMANENT BENCHMARK
BM-4	7 388 298.081	562 101.426	335.054	PERMANENT BENCHMARK
BM-5	7 388 091.843	562 282.991	346.862	PERMANENT BENCHMARK
BM-6	7 387 476.606	562 631.270	363.205	PERMANENT BENCHMARK
BM-7	7 392 760.781	569 757.212	470.316	PERMANENT BENCHMARK
BM-8	7 394 701.849	570 903.508	623.679	PERMANENT BENCHMARK
BM-9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK
BM-10	7 395 099.840	572 102.072	721.812	PERMANENT BENCHMARK
BM-11	7 394 320.998	572 688.263	722.905	PERMANENT BENCHMARK

RECORD DRAWING
NOT FOR CONSTRUCTION

SCALE 1:50000

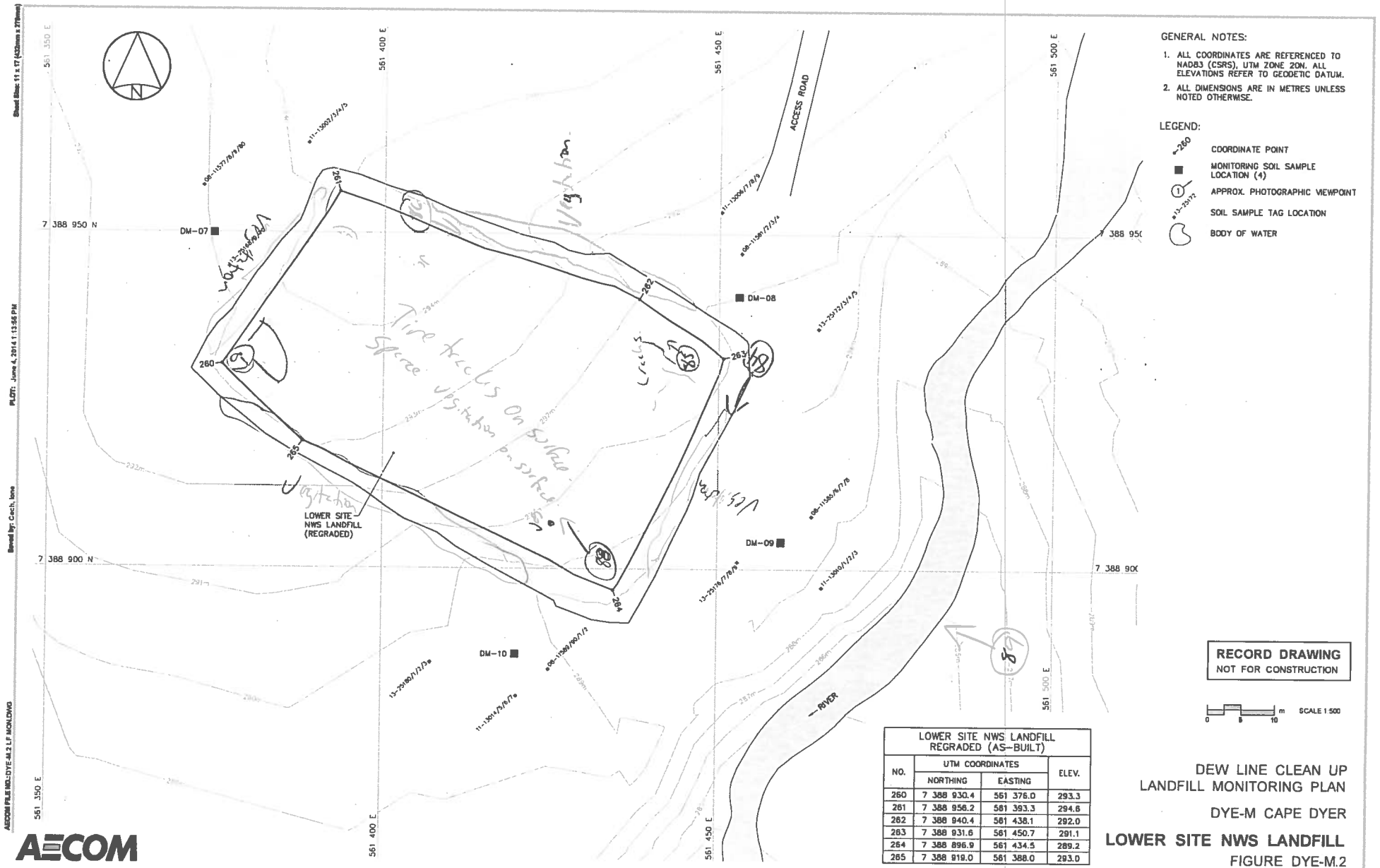
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOCATION PLAN

FIGURE DYE-M.1

AECOM



LOWER SITE NWS LANDFILL REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
260	7 388 930.4	561 376.0	293.3
261	7 388 956.2	561 393.3	294.6
262	7 388 940.4	561 438.1	292.0
263	7 388 931.6	561 450.7	291.1
264	7 388 896.9	561 434.5	289.2
265	7 388 919.0	561 388.0	293.0

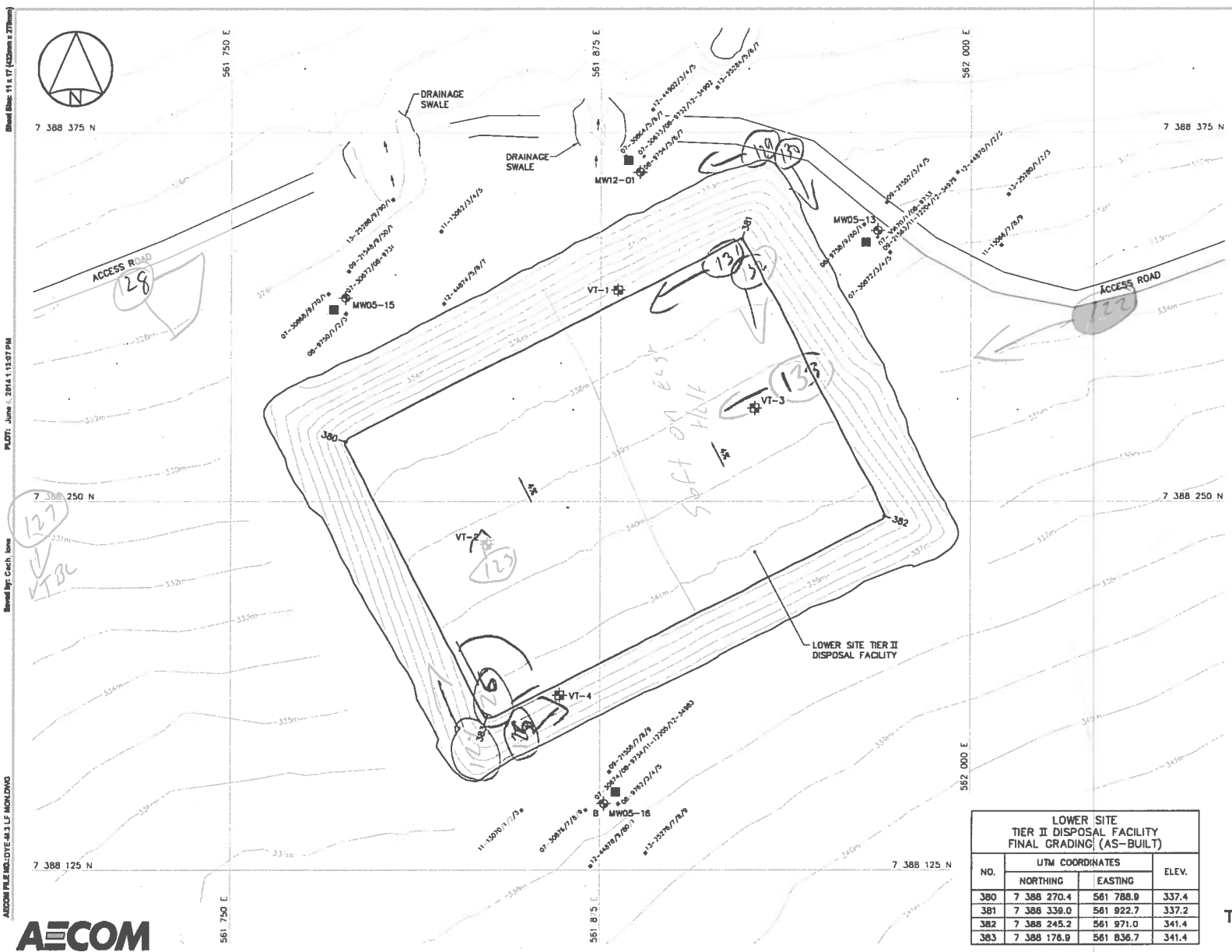
AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE NWS LANDFILL

FIGURE DYE-M.2



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- COORDINATE POINT
- MONITORING WELL LOCATION (3)
- BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- APPROX. PHOTOGRAPHIC VIEWPOINT
- SOIL SAMPLE TAG LOCATION

LOWER SITE TIER II DISPOSAL FACILITY MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-13	7 388 341.9	561 958.6	331.3
MW05-15	7 388 319.1	561 788.8	328.5
MW05-16	7 388 147.7	561 876.5	337.5
MW12-01	7 388 361.7	561 888.3	328.6

LOWER SITE TIER II DISPOSAL FACILITY GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-1	7 388 321.9	561 880.9	336.3
VT-2	7 388 235.5	561 836.6	339.4
VT-3	7 388 281.8	561 927.1	339.4
VT-4	7 388 184.4	561 861.4	340.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

LOWER SITE TIER II DISPOSAL FACILITY FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
380	7 388 270.4	561 788.9	337.4
381	7 388 339.0	561 922.7	337.2
382	7 388 245.2	561 971.0	341.4
383	7 388 176.9	561 836.7	341.4

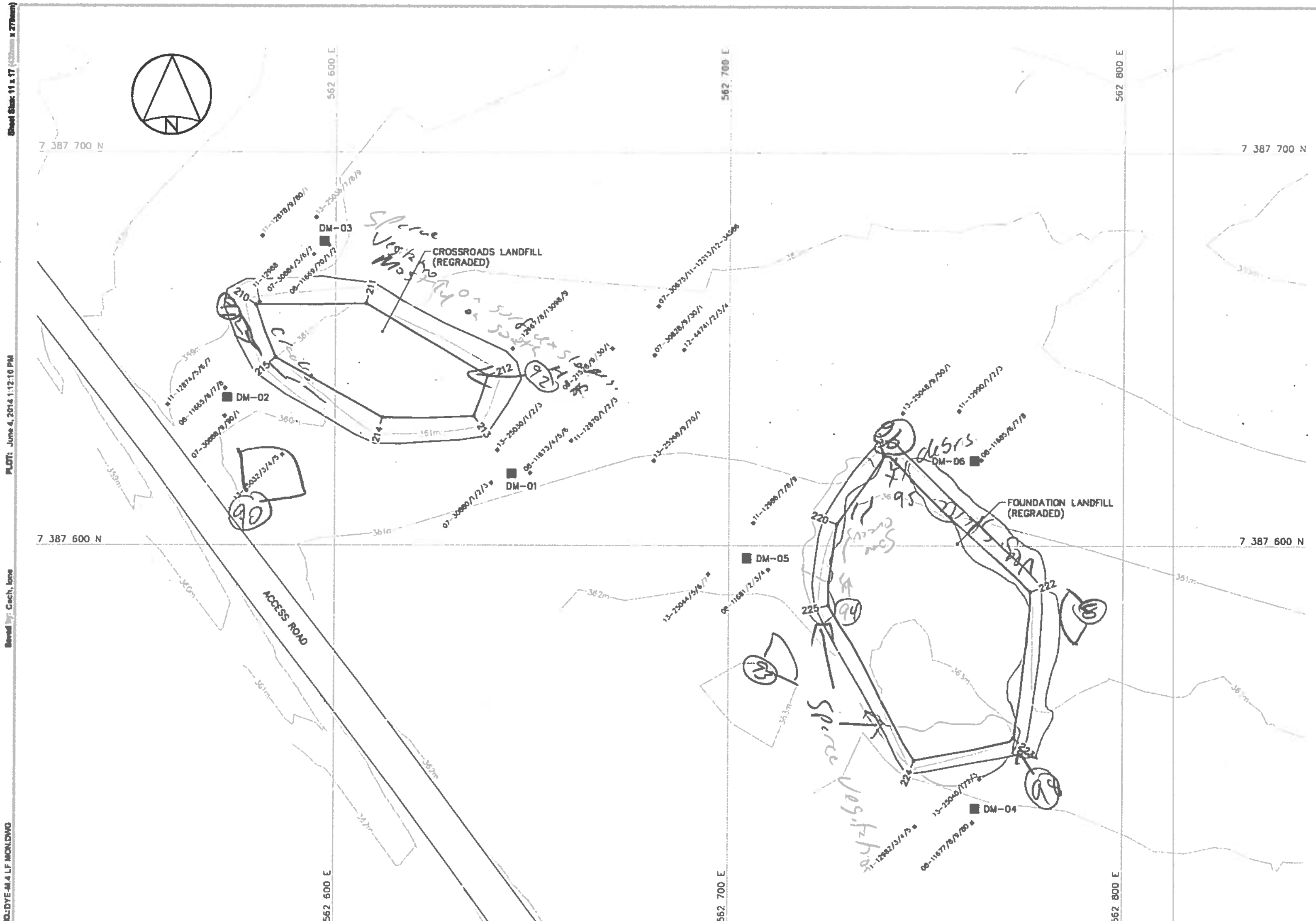
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE TIER II DISPOSAL FACILITY

FIGURE DYE-M.3

AECOM



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 210 COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (6)
- (1) APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-25172 SOIL SAMPLE TAG LOCATION

CROSSROADS LANDFILL REGRADED (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
210	7 387 661.2	562 579.7	360.5
211	7 387 681.6	562 607.7	361.1
212	7 387 643.2	562 638.6	361.6
213	7 387 633.0	562 635.1	361.7
214	7 387 632.7	562 611.9	361.9
215	7 387 647.9	562 584.7	361.0

FOUNDATION LANDFILL REGRADED (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
220	7 387 605.6	562 727.4	362.1
221	7 387 623.0	562 739.5	361.4
222	7 387 588.5	562 776.6	362.0
223	7 387 551.3	562 772.4	363.0
224	7 387 545.5	562 747.3	363.4
225	7 387 584.9	562 725.3	362.6

RECORD DRAWING
NOT FOR CONSTRUCTION

SCALE 1:1000 (0 10 20 m)

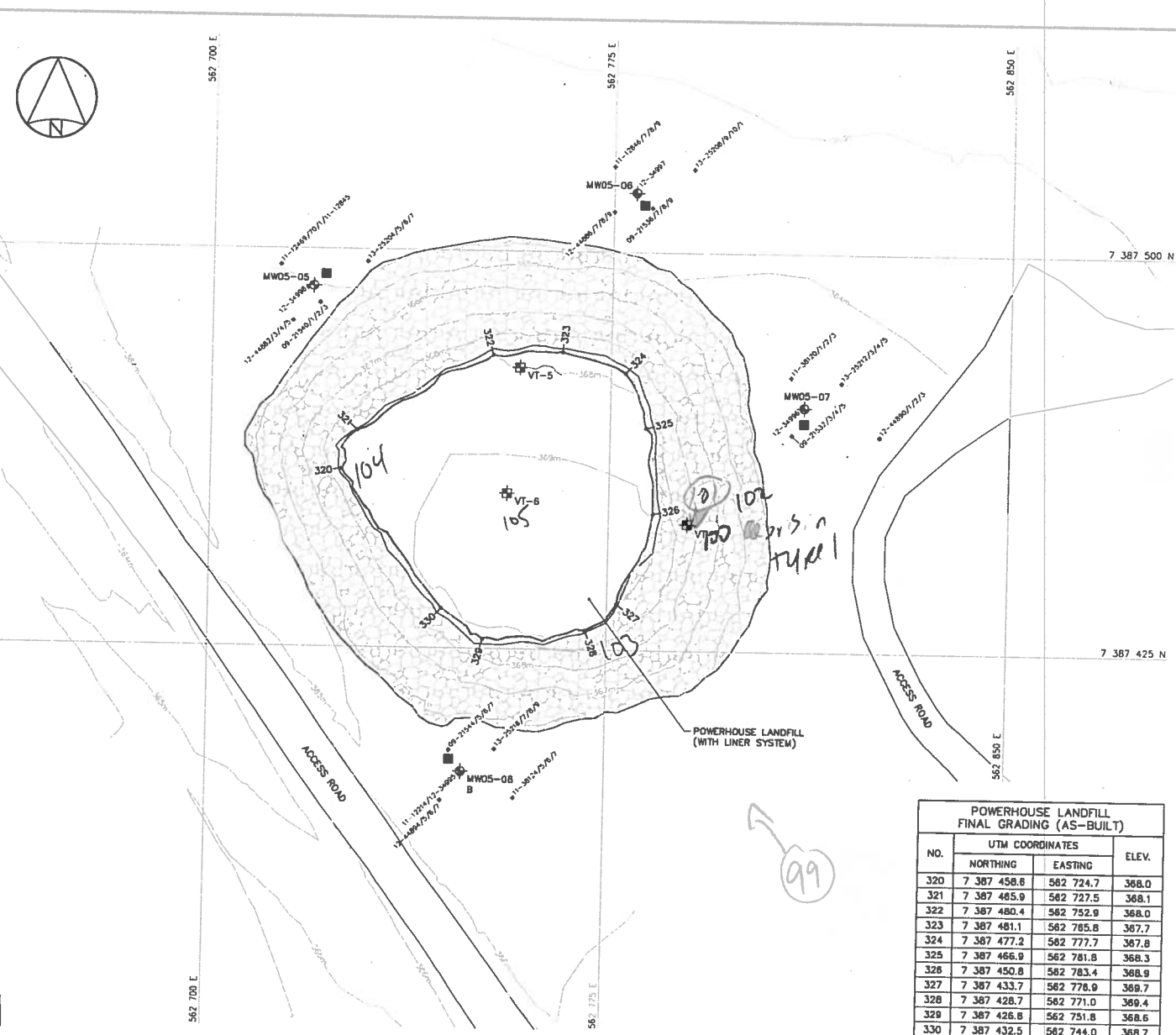
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

CROSSROADS AND FOUNDATION LANDFILLS

FIGURE DYE-M.4

AECOM



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 320 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (3)
- MONITORING SOIL SAMPLE LOCATION (4)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-25172 — SOIL SAMPLE TAG LOCATION

POWERHOUSE LANDFILL MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-05	7 387 493.0	562 718.8	364.1
MW05-06	7 387 511.2	562 779.2	363.7
MW05-07	7 387 471.1	562 811.4	364.5
MW05-08	7 387 401.8	562 748.1	365.5

POWERHOUSE LANDFILL GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-5	7 387 478.1	562 757.9	368.0
VT-6	7 387 454.4	562 755.9	369.5
VT-7	7 387 448.9	562 789.8	*387.6

* NOTE:
ELEVATION IS TO FINAL GRADE OF TYPE 2 GRANULAR FILL PRIOR TO PLACEMENT OF TYPE 1 GRANULAR FILL.

POWERHOUSE LANDFILL FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
320	7 387 458.6	562 724.7	368.0
321	7 387 465.9	562 727.5	368.1
322	7 387 480.4	562 752.9	368.0
323	7 387 481.1	562 765.8	367.7
324	7 387 477.2	562 777.7	367.8
325	7 387 466.9	562 781.8	368.3
326	7 387 450.8	562 783.4	368.9
327	7 387 433.7	562 776.9	369.7
328	7 387 428.7	562 771.0	369.4
329	7 387 426.8	562 751.8	368.6
330	7 387 432.5	562 744.0	368.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

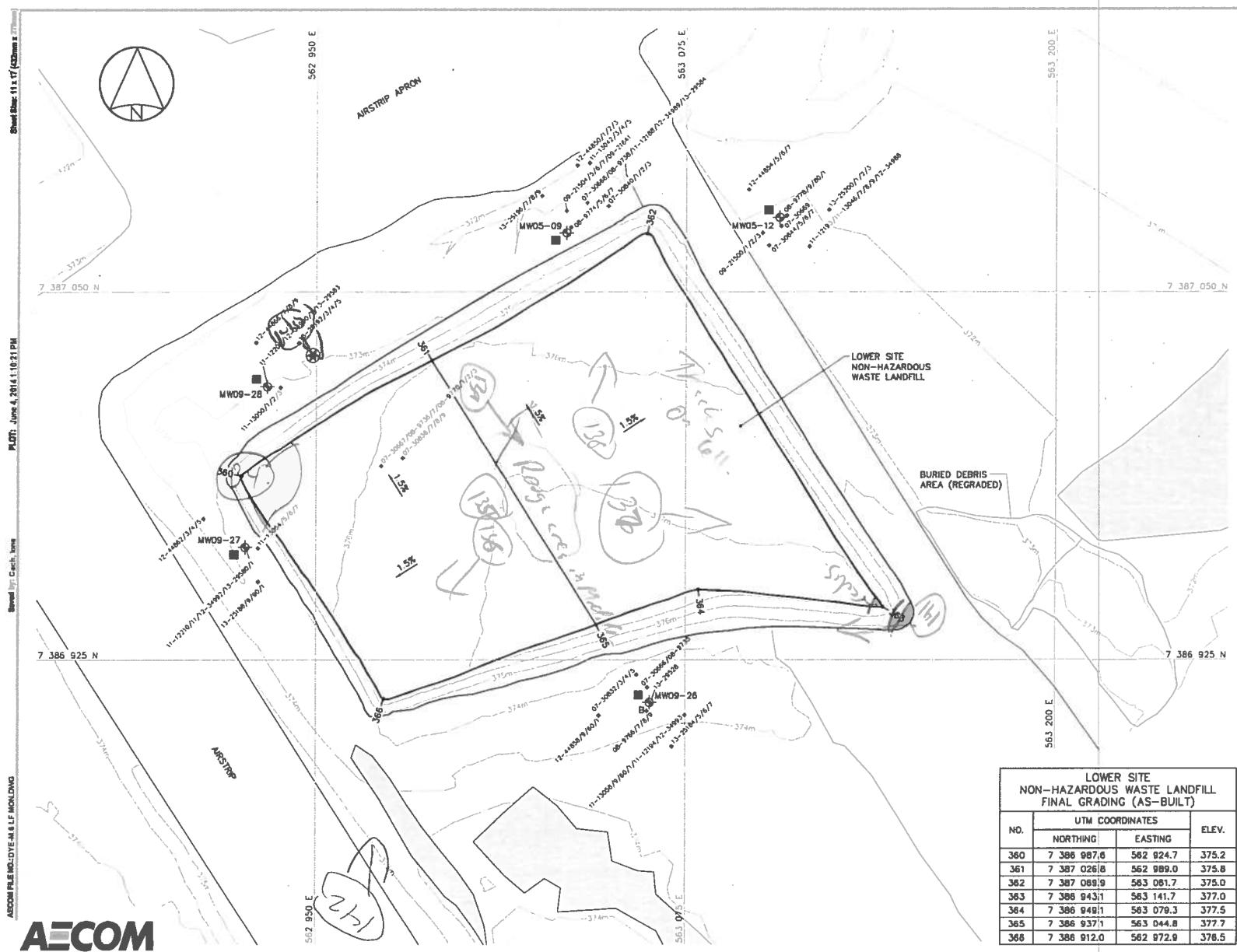
AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

POWERHOUSE LANDFILL

FIGURE DYE-M.5



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 360 — COORDINATE POINT
- MONITORING WELL LOCATION (4)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- APPROXIMATE LOCATION OF COMMEMORATIVE PLAQUE
- MONITORING SOIL SAMPLE LOCATION (5)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-25172 — SOIL SAMPLE TAG LOCATION

LOWER SITE NON-HAZARDOUS WASTE LANDFILL MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW05-09	7 387 070.2	563 034.5	372.6
MW05-12	7 387 075.3	563 106.6	371.7
MW09-26	7 386 910.8	563 062.9	373.8
MW09-27	7 386 963.5	562 926.1	373.0
MW09-28	7 387 018.0	562 933.5	373.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

LOWER SITE NON-HAZARDOUS WASTE LANDFILL FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
360	7 386 987.6	562 924.7	375.2
361	7 387 026.8	562 989.0	375.8
362	7 387 069.9	563 061.7	375.0
363	7 386 943.1	563 141.7	377.0
364	7 386 949.1	563 079.3	377.5
365	7 386 937.1	563 044.8	377.7
366	7 386 912.0	562 972.9	376.5

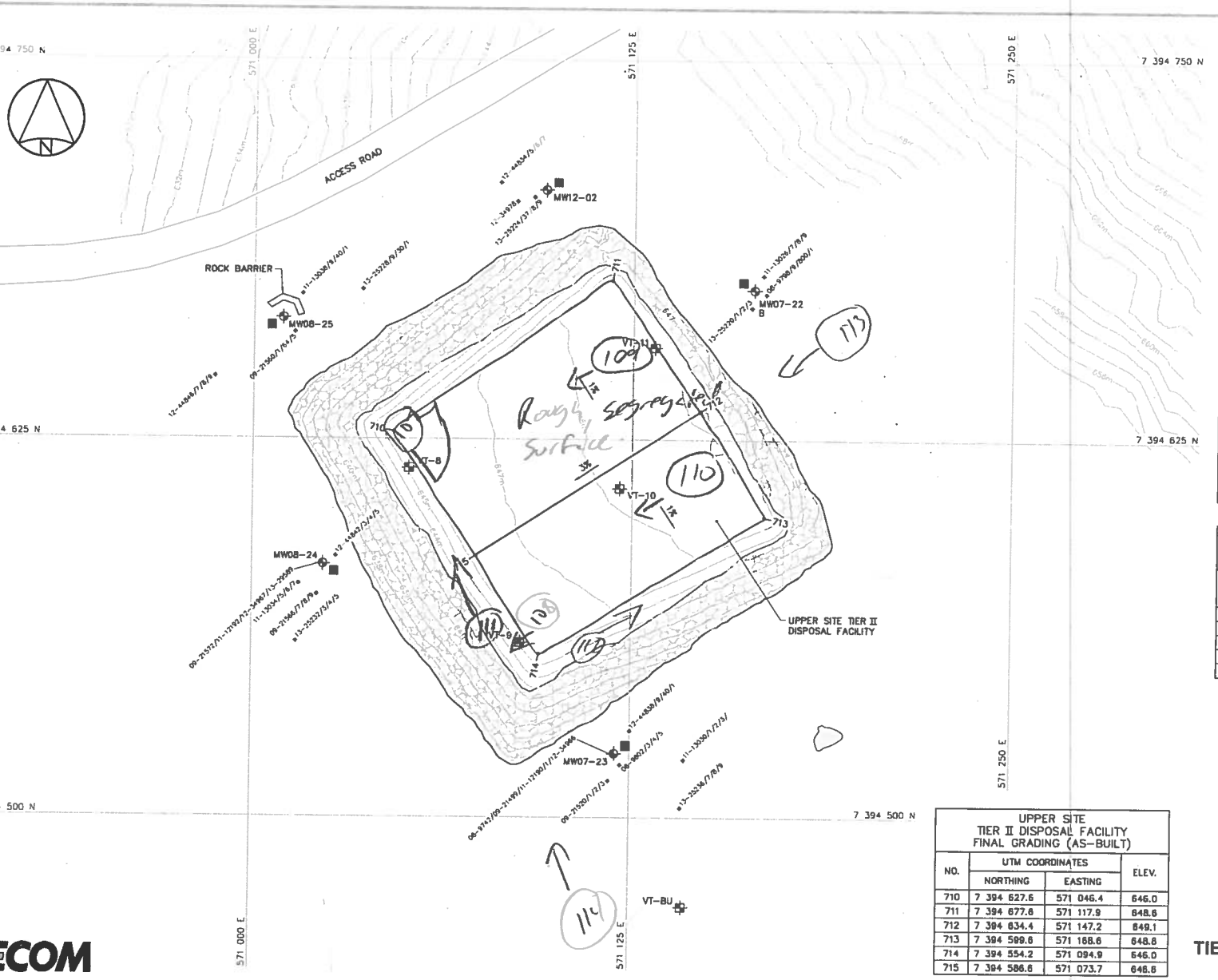
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

LOWER SITE NON - HAZARDOUS WASTE LANDFILL

FIGURE DYE-M.6

AECOM



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- COORDINATE POINT
- MONITORING WELL LOCATION (4)
- BACKGROUND MONITORING WELL LOCATION (1)
- VERTICAL GROUND TEMPERATURE CABLE LOCATION (5)
- MONITORING SOIL SAMPLE LOCATION (5)
- APPROX. PHOTOGRAPHIC VIEWPOINT
- SOIL SAMPLE TAG LOCATION

UPPER SITE
TIER II DISPOSAL FACILITY
MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW07-22	7 394 674.6	571 164.7	648.5
MW07-23	7 394 521.5	571 120.1	638.2
MW08-24	7 394 583.7	571 023.4	636.1
MW08-25	7 394 664.9	571 009.6	635.1
MW12-02	7 394 707.4	571 095.9	642.3

UPPER SITE
TIER II DISPOSAL FACILITY
GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-8	7 394 615.5	571 051.5	645.4
VT-9	7 394 558.0	571 088.7	645.5
VT-10	7 394 609.0	571 121.0	648.2
VT-11	7 394 655.5	571 132.2	648.9
VT-BU	7 394 470.7	571 142.6	636.9

RECORD DRAWING
NOT FOR CONSTRUCTION

SCALE 1:1250
0 12.5 25 m

UPPER SITE
TIER II DISPOSAL FACILITY
FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
710	7 394 627.6	571 046.4	646.0
711	7 394 677.6	571 117.9	648.6
712	7 394 634.4	571 147.2	649.1
713	7 394 589.6	571 188.6	648.6
714	7 394 554.2	571 094.9	646.0
715	7 394 586.6	571 073.7	648.6

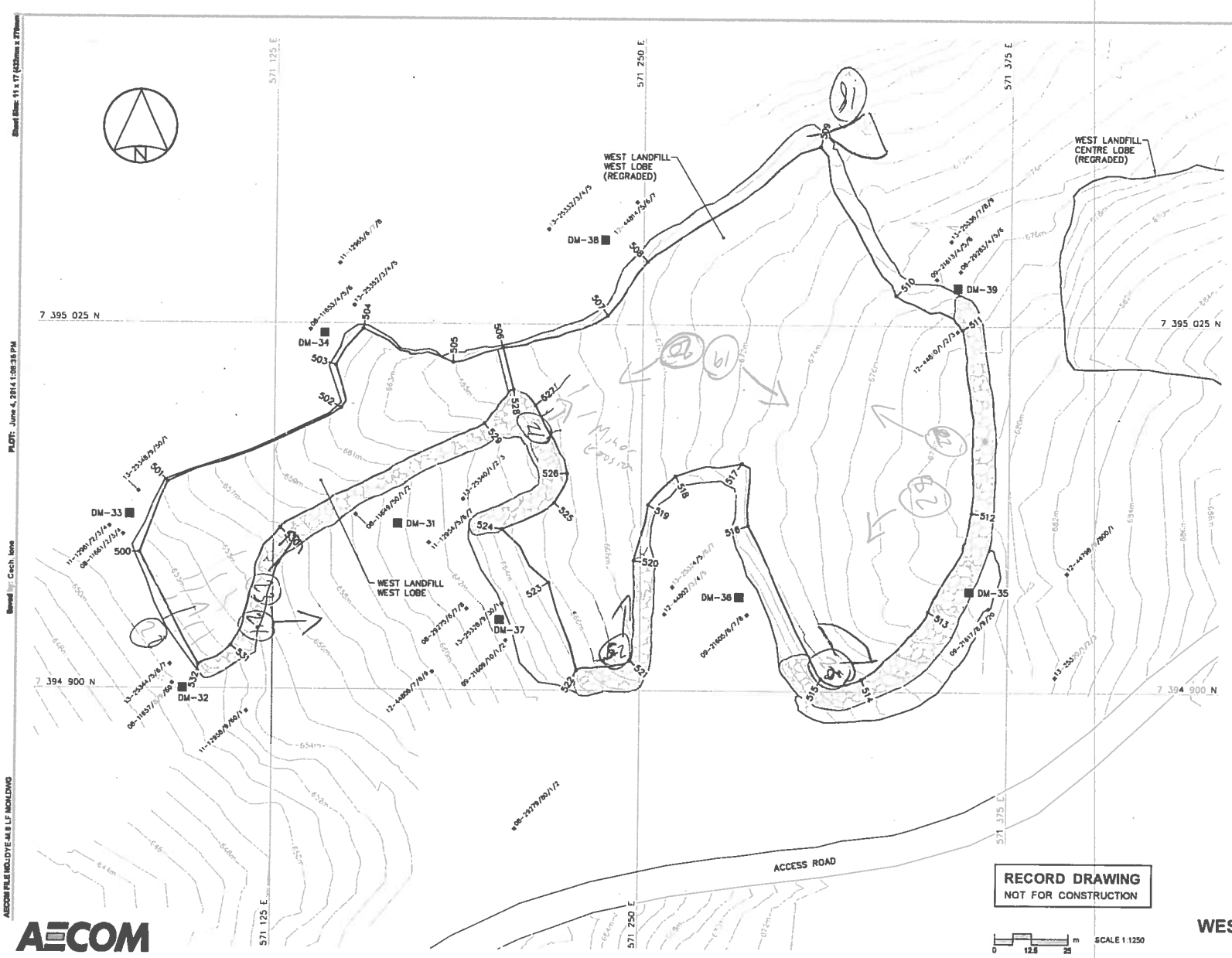
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE
TIER II DISPOSAL FACILITY

FIGURE DYE-M.7

AECOM



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 500 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (9)
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-25172 — SOIL SAMPLE TAG LOCATION

WEST LANDFILL–WEST LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
500	7 394 946.8	571 079.6	652.3
501	7 394 970.9	571 088.9	655.3
502	7 394 998.4	571 147.7	661.3
503	7 395 011.0	571 145.7	660.5
504	7 395 023.3	571 155.0	660.6
505	7 395 012.0	571 185.6	664.9
506	7 395 017.0	571 202.5	666.2
507	7 395 028.1	571 238.0	668.7
508	7 395 046.7	571 251.4	669.3
509	7 395 066.2	571 309.8	670.5
510	7 395 035.6	571 336.0	675.3
511	7 395 023.9	571 358.6	678.3
512	7 394 981.5	571 362.4	679.5
513	7 394 927.8	571 347.9	677.6
514	7 394 904.4	571 325.4	673.5
515	7 394 904.6	571 311.6	672.0
516	7 394 956.8	571 286.4	673.4
517	7 394 977.9	571 284.2	673.0
518	7 394 973.6	571 261.6	670.3
519	7 394 963.7	571 252.3	669.4
520	7 394 944.7	571 247.6	669.0
521	7 394 910.5	571 246.5	667.6
522	7 394 907.1	571 228.5	664.8
523	7 394 937.1	571 218.8	665.8
524	7 394 955.1	571 202.8	664.5
525	7 394 964.3	571 220.4	666.2
526	7 394 974.3	571 224.8	666.8
527	7 394 997.5	571 213.7	666.2
528	7 395 002.8	571 208.2	666.0
529	7 394 991.2	571 196.4	663.9
530	7 394 955.4	571 127.3	656.8
531	7 394 915.0	571 110.8	653.4
532	7 394 908.5	571 099.8	651.5

RECORD DRAWING
NOT FOR CONSTRUCTION

0 12.5 25 m SCALE 1:1250

AECOM

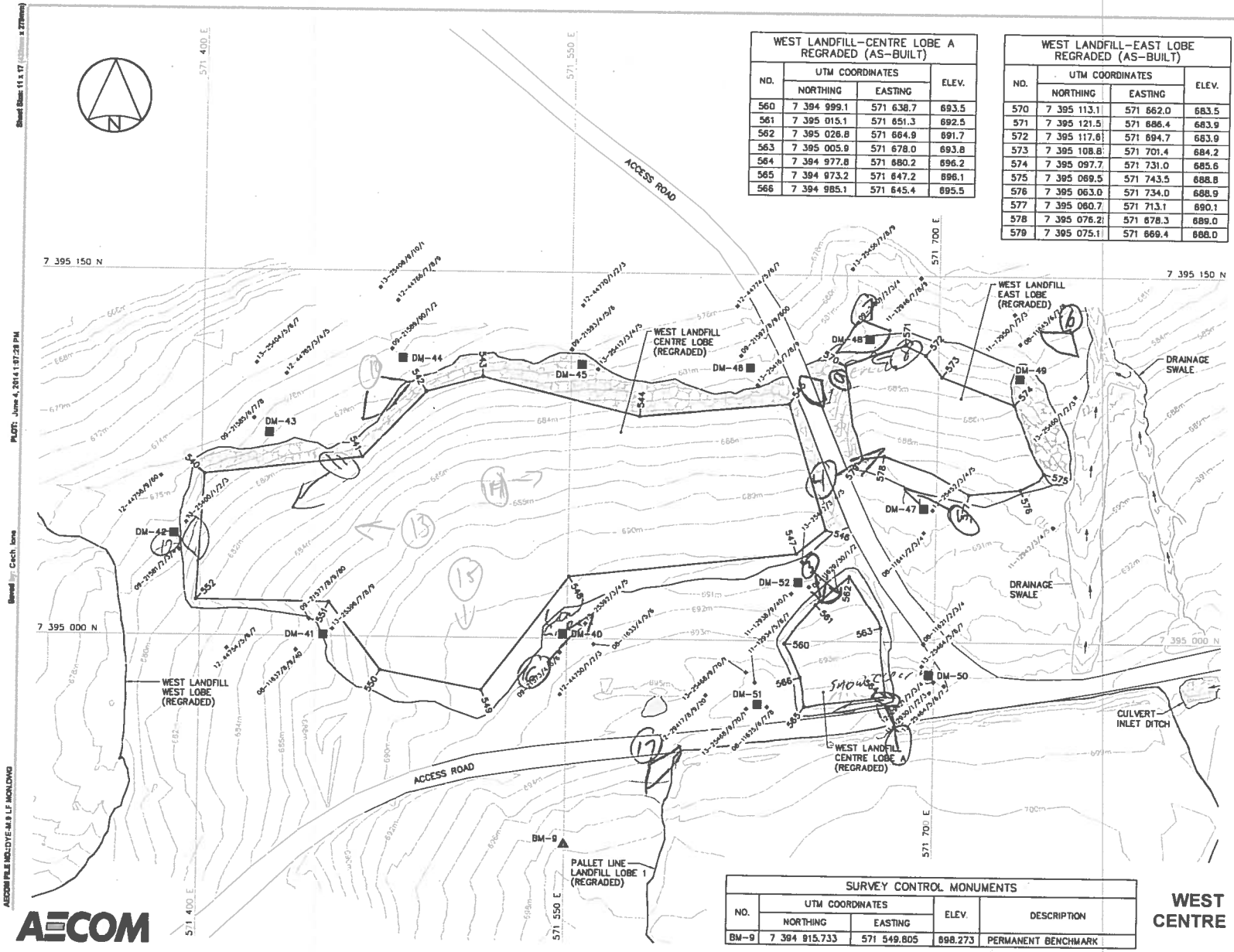
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

WEST LANDFILL - WEST LOBE

FIGURE DYE-M.8

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: June 4, 2014 11:08:35 PM
Saved by: Cech, Iona
AECOM FILE NO: DYE-M.8 LF MONITORING



WEST LANDFILL–CENTRE LOBE A REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
560	7 394 999.1	571 638.7	693.5
561	7 395 015.1	571 651.3	692.5
562	7 395 026.8	571 664.9	691.7
563	7 395 005.9	571 678.0	693.8
564	7 394 977.8	571 680.2	696.2
565	7 394 973.2	571 647.2	696.1
566	7 394 985.1	571 645.4	695.5

WEST LANDFILL–EAST LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
570	7 395 113.1	571 662.0	683.5
571	7 395 121.5	571 686.4	683.9
572	7 395 117.6	571 694.7	683.9
573	7 395 108.8	571 701.4	684.2
574	7 395 097.7	571 731.0	685.6
575	7 395 089.5	571 743.5	688.8
576	7 395 063.0	571 734.0	688.9
577	7 395 060.7	571 713.1	690.1
578	7 395 076.2	571 678.3	689.0
579	7 395 075.1	571 669.4	688.0

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM–9 — PERMANENT BENCHMARK LOCATION (1)
- 540 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (13)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- SOIL SAMPLE TAG LOCATION

WEST LANDFILL–CENTRE LOBE REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
540	7 395 086.2	571 401.3	677.4
541	7 395 073.6	571 465.5	681.2
542	7 395 100.7	571 491.2	680.3
543	7 395 107.1	571 514.2	680.6
544	7 395 091.5	571 578.3	684.4
545	7 395 097.3	571 639.3	683.5
546	7 395 045.7	571 655.0	690.4
547	7 395 035.9	571 643.1	690.6
548	7 395 025.6	571 550.6	690.9
549	7 394 978.7	571 515.4	692.0
550	7 394 986.4	571 474.0	689.7
551	7 395 014.1	571 452.7	687.3
552	7 395 014.8	571 398.4	681.6

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM–9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK

RECORD DRAWING
NOT FOR CONSTRUCTION

SCALE 1:1500
0 15 30 m

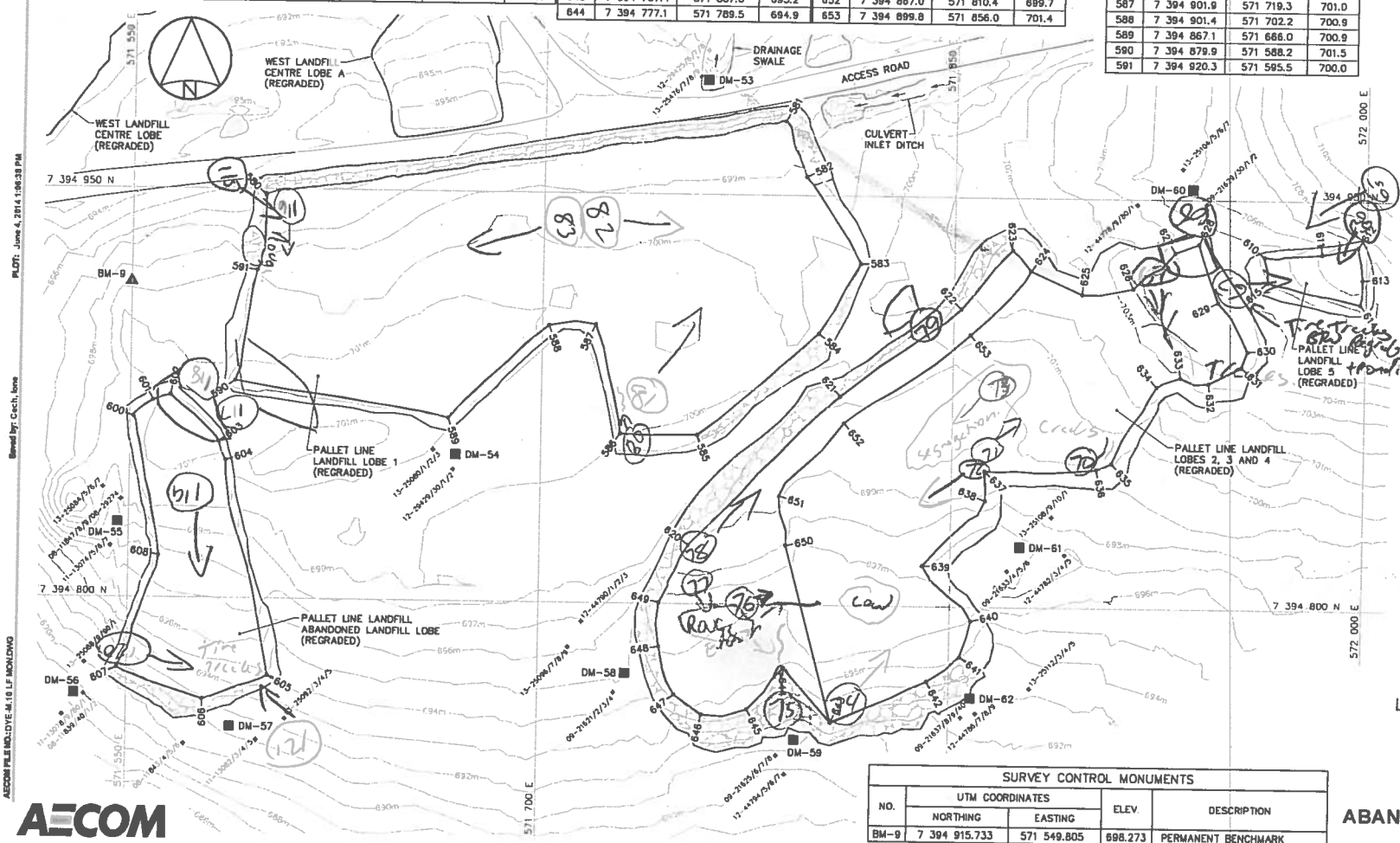
AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

WEST LANDFILL - CENTRE LOBE, CENTRE LOBE A AND EAST LOBE

FIGURE DYE-M.9



PALLET LINE LANDFILL–LOBES 2,3,4 REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.	NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING			NORTHING	EASTING			NORTHING	EASTING			NORTHING	EASTING	
620	7 394 821.6	571 754.3	698.8	628	7 394 933.9	571 938.8	704.9	636	7 394 850.9	571 902.5	700.0	645	7 394 781.8	571 776.5	694.4
621	7 394 876.7	571 808.9	700.1	629	7 394 912.7	571 946.1	704.4	637	7 394 850.1	571 861.8	699.7	646	7 394 759.7	571 759.9	694.6
622	7 394 909.2	571 852.5	701.8	630	7 394 894.9	571 957.1	704.4	638	7 394 839.1	571 862.2	698.6	647	7 394 766.9	571 749.9	695.3
623	7 394 931.0	571 870.9	702.7	631	7 394 889.1	571 954.9	704.4	639	7 394 815.1	571 839.6	697.1	648	7 394 784.4	571 744.1	696.1
624	7 394 923.5	571 877.7	702.9	632	7 394 883.0	571 943.0	703.3	640	7 394 795.1	571 857.7	695.9	649	7 394 800.5	571 743.8	696.8
625	7 394 915.1	571 896.4	702.4	633	7 394 885.0	571 932.7	702.6	641	7 394 781.9	571 853.8	695.1	650	7 394 821.9	571 789.7	697.9
626	7 394 917.3	571 915.1	703.8	634	7 394 881.5	571 924.1	702.6	642	7 394 772.7	571 841.8	694.4	651	7 394 840.0	571 787.1	699.3
627	7 394 930.7	571 930.2	704.5	635	7 394 853.3	571 908.1	700.1	643	7 394 757.4	571 807.0	693.2	652	7 394 867.0	571 810.4	699.7
								644	7 394 777.1	571 789.5	694.9	653	7 394 899.8	571 856.0	701.4

PALLET LINE LANDFILL–LOBE 1 REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
580	7 394 947.7	571 598.4	696.8
581	7 394 977.1	571 787.5	697.8
582	7 394 958.8	571 795.4	699.1
583	7 394 925.3	571 815.6	700.1
584	7 394 899.6	571 800.7	700.0
585	7 394 862.0	571 756.9	699.7
586	7 394 862.2	571 728.9	700.2
587	7 394 901.9	571 719.3	701.0
588	7 394 901.4	571 702.2	700.9
589	7 394 867.1	571 668.0	700.9
590	7 394 879.9	571 588.2	701.5
591	7 394 920.3	571 595.5	700.0

GENERAL NOTES:

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2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-9 — PERMANENT BENCHMARK LOCATION (1)
- 580 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (10)
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-25172 — SOIL SAMPLE TAG LOCATION

PALLET LINE LANDFILL–ABANDONED LANDFILL LOBE REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
600	7 394 866.5	571 551.1	700.6
601	7 394 872.4	571 558.3	700.9
602	7 394 874.4	571 564.7	701.2
603	7 394 857.5	571 582.4	701.1
604	7 394 850.7	571 585.1	700.8
605	7 394 772.0	571 601.4	694.9
606	7 394 763.2	571 577.7	692.9
607	7 394 774.4	571 546.4	691.8
608	7 394 815.7	571 561.0	697.7

PALLET LINE LANDFILL–LOBE 5 REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
610	7 394 929.4	571 962.8	705.3
611	7 394 930.6	571 983.7	707.1
612	7 394 933.4	571 998.8	707.9
613	7 394 921.6	571 998.5	707.4
614	7 394 912.6	571 997.8	706.6
615	7 394 920.3	571 964.0	705.0

RECORD DRAWING
NOT FOR CONSTRUCTION

m SCALE 1:1500
0 15 30

SURVEY CONTROL MONUMENTS

NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-9	7 394 915.733	571 549.805	698.273	PERMANENT BENCHMARK

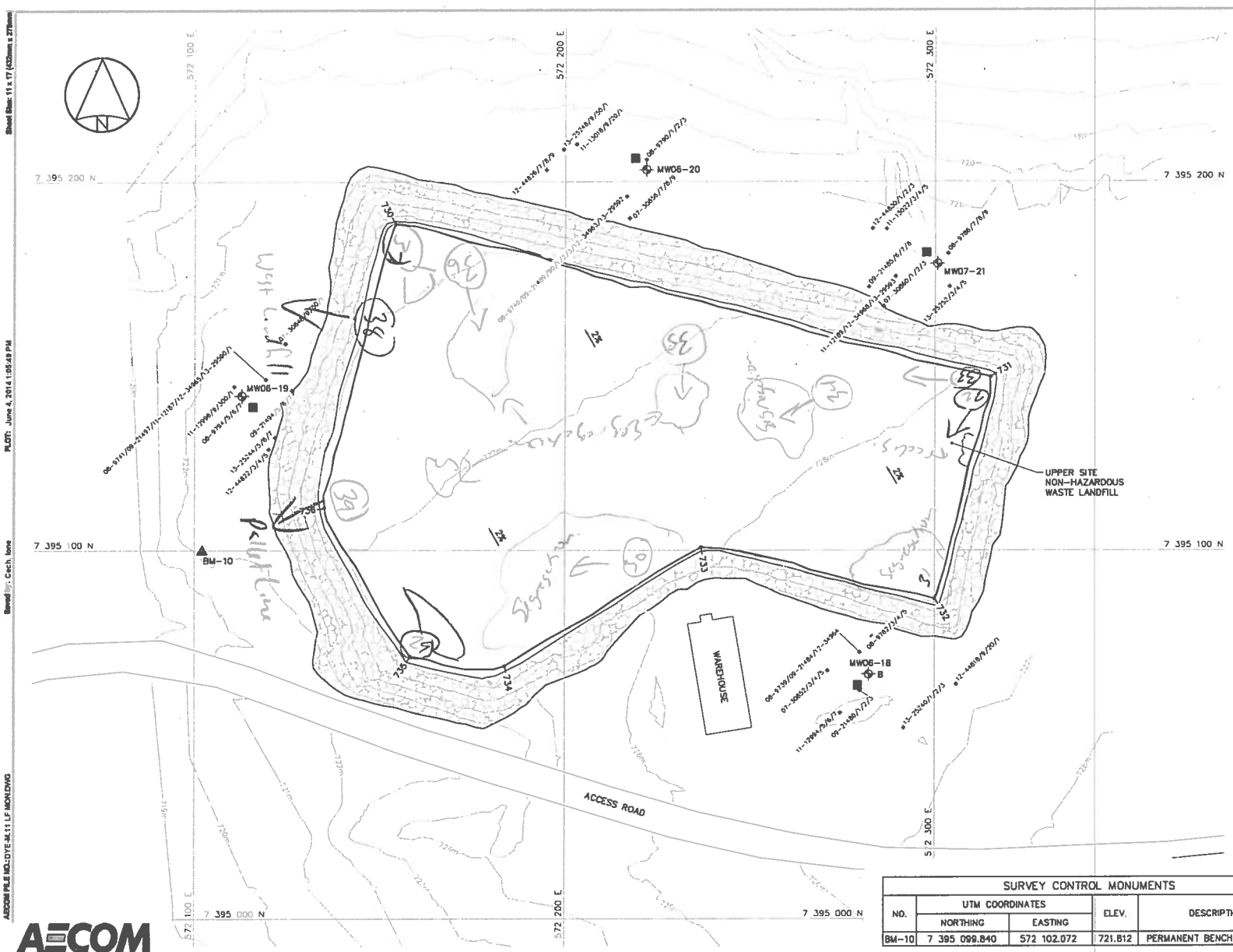
AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

PALLET LINE LANDFILL LOBES 1, 2, 3, 4, 5 AND ABANDONED LANDFILL LOBE

FIGURE DYE-M.10



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-10 — PERMANENT BENCHMARK LOCATION (1)
- 730 — COORDINATE POINT
- MONITORING WELL LOCATION (3)
- B — BACKGROUND MONITORING WELL LOCATION (1)
- MONITORING SOIL SAMPLE LOCATION (4)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT
- SOIL SAMPLE TAG LOCATION

UPPER SITE NON-HAZARDOUS WASTE LANDFILL FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
730	7 395 188.6	572 154.3	725.6
731	7 395 147.2	572 315.1	728.0
732	7 395 087.0	572 300.1	728.8
733	7 395 100.9	572 237.0	727.9
734	7 395 068.7	572 183.8	728.0
735	7 395 071.3	572 158.4	727.7
736	7 395 111.6	572 135.1	726.7

UPPER SITE NON-HAZARDOUS WASTE LANDFILL MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW06-18	7 395 068.5	572 282.3	725.6
MW06-19	7 395 142.0	572 112.7	722.5
MW06-20	7 395 203.3	572 222.0	720.6
MW07-21	7 395 177.9	572 300.7	721.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

SURVEY CONTROL MONUMENTS

NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-10	7 395 099.840	572 102.072	721.812	PERMANENT BENCHMARK

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE NON - HAZARDOUS WASTE LANDFILL

FIGURE DYE-M.11

AECOM

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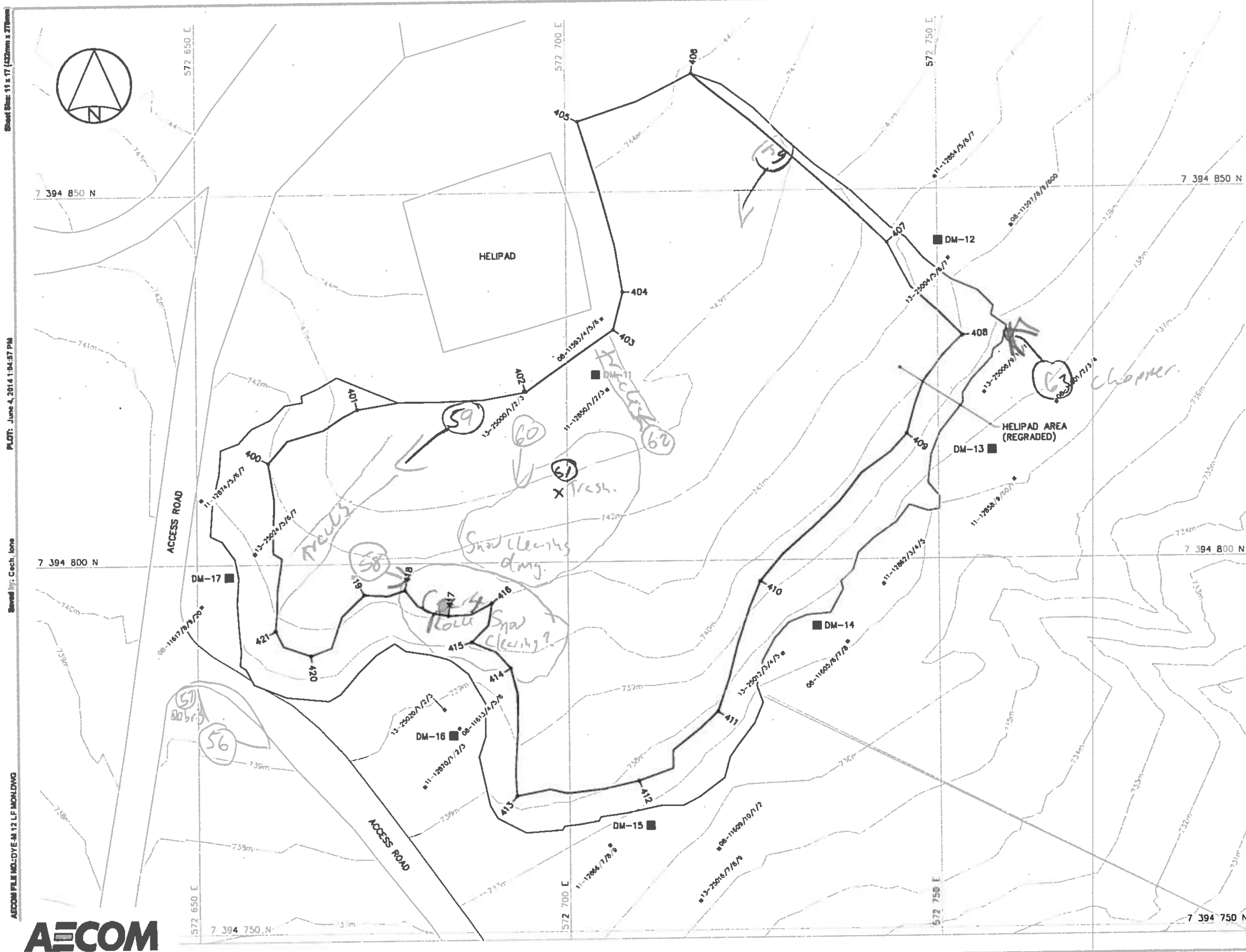
PLOT: June 4, 2014 1:05:49 PM
Saved by: Cech, Ione
AECOM FILE NO.: DYE-M.11 LF MONI.DWG



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (7)
- APPROX. PHOTOGRAPHIC VIEWPOINT
- SOIL SAMPLE TAG LOCATION

HELIPAD AREA REGRADED (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
400	7 394 813.8	572 659.7	742.0
401	7 394 820.9	572 671.7	743.4
402	7 394 823.1	572 694.4	743.4
403	7 394 831.4	572 706.3	743.3
404	7 394 836.4	572 707.6	743.4
405	7 394 859.5	572 701.7	744.2
406	7 394 865.9	572 717.0	743.9
407	7 394 842.9	572 743.2	741.7
408	7 394 830.2	572 753.4	740.0
409	7 394 817.0	572 745.8	739.5
410	7 394 797.2	572 725.9	739.4
411	7 394 779.6	572 720.0	737.8
412	7 394 770.3	572 709.3	737.8
413	7 394 768.4	572 692.9	738.3
414	7 394 785.7	572 692.2	739.8
415	7 394 789.3	572 686.9	740.2
416	7 394 794.6	572 689.6	740.9
417	7 394 792.9	572 683.8	741.1
418	7 394 796.4	572 678.0	741.4
419	7 394 795.8	572 672.5	741.2
420	7 394 787.7	572 665.2	740.6
421	7 394 791.1	572 660.5	740.8

RECORD DRAWING
NOT FOR CONSTRUCTION

SCALE 1:500

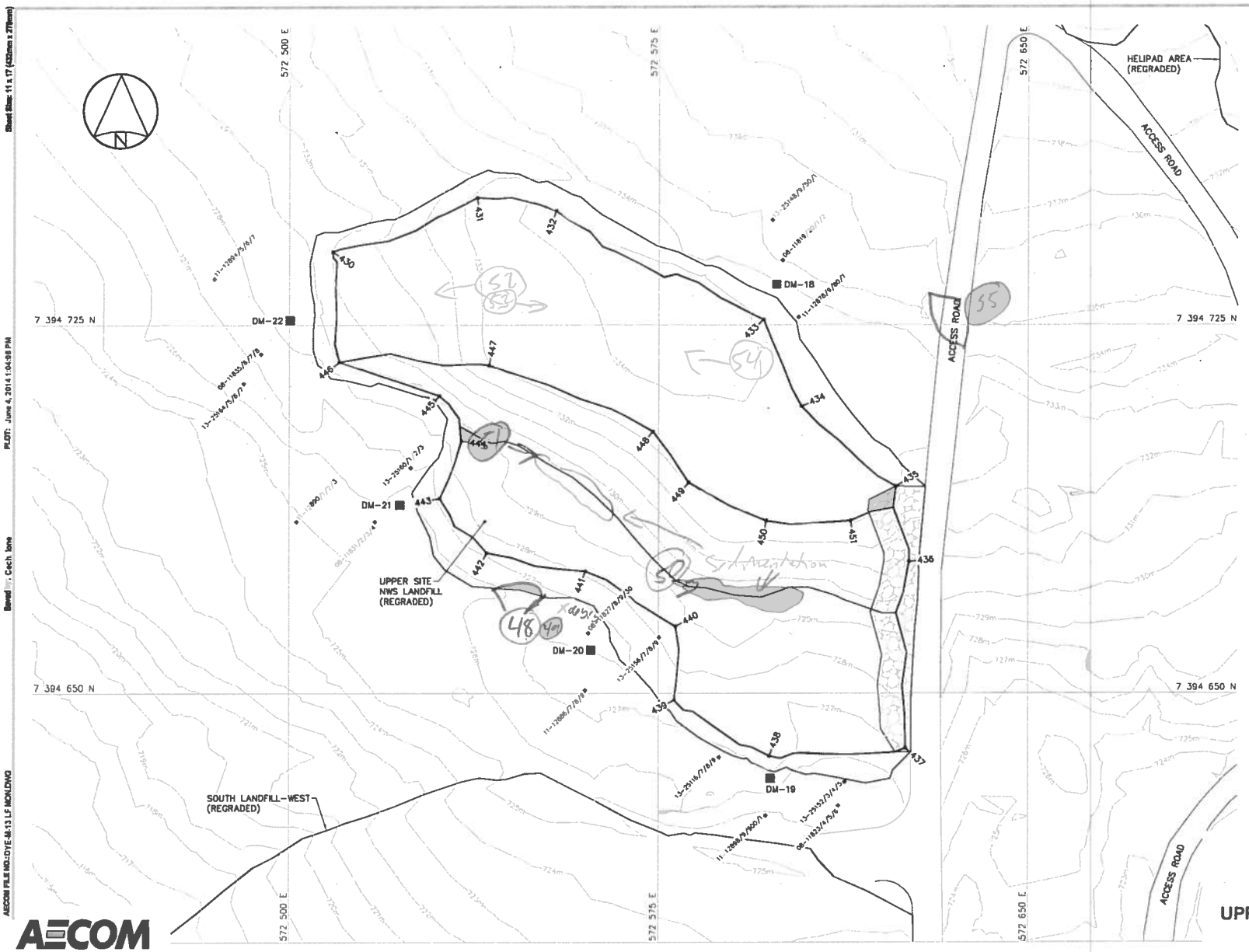
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

HELIPAD AREA
FIGURE DYE-M.12

AECOM

AECOM FILE NO.: DYE-M 12 LF MON.DWG



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 430 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- ① — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-2312 — SOIL SAMPLE TAG LOCATION

UPPER SITE NWS LANDFILL REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
430	7 394 739.9	572 508.8	730.1
431	7 394 750.8	572 538.1	733.3
432	7 394 748.2	572 554.1	734.0
433	7 394 726.1	572 596.3	733.9
434	7 394 708.5	572 604.0	733.8
435	7 394 692.1	572 623.2	733.1
436	7 394 676.8	572 625.8	730.8
437	7 394 638.9	572 625.2	727.2
438	7 394 637.2	572 597.5	727.5
439	7 394 648.8	572 578.2	727.7
440	7 394 663.8	572 578.4	728.8
441	7 394 674.8	572 560.2	728.2
442	7 394 678.5	572 540.1	727.1
443	7 394 689.6	572 530.8	727.2
444	7 394 701.4	572 534.9	728.7
445	7 394 710.8	572 530.5	729.4
446	7 394 717.5	572 510.1	729.0
447	7 394 716.8	572 540.5	733.0
448	7 394 703.3	572 573.8	733.5
449	7 394 692.9	572 581.1	733.1
450	7 394 685.1	572 596.9	733.0
451	7 394 685.1	572 614.0	733.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

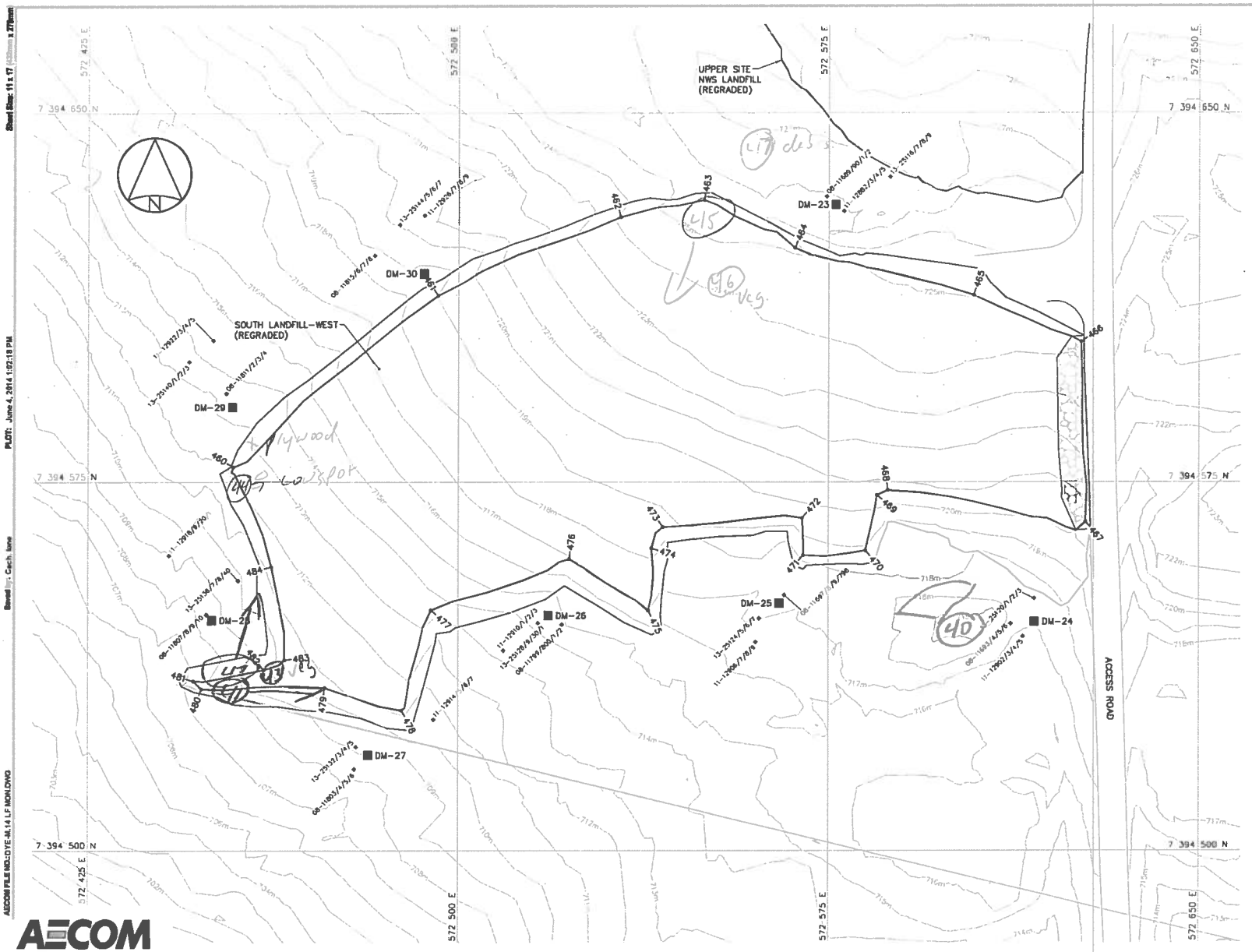
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

UPPER SITE NWS LANDFILL

FIGURE DYE-M.13

AECOM



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 20N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 460 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (8)
- ① — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-2512 — SOIL SAMPLE TAG LOCATION

SOUTH LANDFILL-WEST REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
460	7 394 578.0	572 454.4	712.2
461	7 394 612.9	572 495.9	719.0
462	7 394 628.8	572 532.8	724.1
463	7 394 632.2	572 549.7	725.5
464	7 394 622.5	572 568.1	725.1
465	7 394 613.0	572 604.2	725.0
466	7 394 603.5	572 626.1	724.3
467	7 394 566.8	572 627.0	720.5
468	7 394 573.3	572 586.9	720.7
469	7 394 572.3	572 584.7	720.6
470	7 394 561.0	572 582.4	718.9
471	7 394 560.1	572 569.8	718.3
472	7 394 567.6	572 569.6	719.5
473	7 394 565.8	572 541.4	718.8
474	7 394 561.5	572 539.1	718.2
475	7 394 548.8	572 538.5	717.0
476	7 394 559.3	572 522.5	718.9
477	7 394 548.9	572 494.5	713.5
478	7 394 528.6	572 488.5	711.2
479	7 394 533.2	572 473.0	710.8
480	7 394 532.9	572 448.0	707.6
481	7 394 534.6	572 446.4	707.4
482	7 394 536.8	572 460.6	709.9
483	7 394 538.9	572 484.8	710.5
484	7 394 557.7	572 462.1	711.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

DYE-M CAPE DYER

SOUTH LANDFILL - WEST

FIGURE DYE-M.14

AECOM

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VAT	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07 0		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	8/14/2013		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	13.979	3.1964
	15.495	1.1706
	10.618	-0.2064
	17.122	-0.8172
	17.517	-1.2870
	17.988	-1.8177
	18.222	-2.0647
	18.483	-2.3380

Bead	ohms	Degrees C
	18.632	-2.5603
	18.754	-2.7053
	18.875	-2.8298
	19.018	-2.9596
	19.074	-3.0609

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VT2	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110052		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	8/14/2013		
Battery Levels	Main 11.34	Aux 13.63	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.508	7.1244
	11.859	6.5069
	12.972	4.6874
	14.320	2.6916
	15.724	0.8279
	16.418	-0.0597
	16.675	-0.3515
	18.42	-2.7442

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/14/2014
Prepared By:	

Thermistor Information

Site Name: VT3	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110053		Cable Serial Number	

Master 2501 key

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date	8/14/2014	
Battery Levels	Main 11.34	Aux 13.56

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.227	7.6301
	11.917	6.4294
	12.868	4.9045
	14.144	2.9543
	15.445	1.1933
	16.413	-0.0166
	17.099	-0.7968

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name: AECOM	Inspection Date: 8/14/2014
Prepared By: Mcotteli	

Thermistor Information

Site Name: VTY	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110055		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date	8/14/2013	
Battery Levels	Main 11.34	Aux 13.50

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	11.079	7.9761
2	11.253	7.6101
3	11.805	6.6668
4	12.776	5.0367
5	13.979	3.2344
6	16.046	0.1871
7	16.951	-0.5574
8	17.452	-1.1234

Bead	ohms	Degrees C
9	17.982	-1.6996
10	18.302	-2.0879
11	18.518	-2.3277
12	18.727	-2.5603

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM.	Inspection Date:	8/12/2014
Prepared By:	Mlotecki.		

Thermistor Information

Site Name:		Thermistor Location	VT5
Thermistor Number:	VT5	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110024	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	Clamp was loose. → tightened.
Beads	☑	☐	
Battery Installation Date	8/9/2012		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	9.150	9.2765
	11.453	8.9312
	12.996	8.1342
	14.499	6.4694
	16.360	3.9513
	17.050	1.0270
	17.663	-0.4735
	18.357	-1.3689

Bead	ohms	Degrees C
	19.365	-2.0081
	19.818	-3.0609
	19.79	-3.7264

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/12/2014
Prepared By:	

Thermistor Information

Site Name:	Thermistor Location	VT 6	
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)		Nodal Points
Datalogger Serial # 0711	25		Cable Serial Number

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☐	☐	Top cable bead.
Battery Installation Date	8-9-2012		
Battery Levels	Main 11.34	Aux 13.50	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	9.166	138.6296
	8.602	7.0143
	9.248	5.0143
	11.798	2.5569
	13.024	-0.166
	15.519	-0.8656
	16.725	-1.5765
	17.515	-2.3277

Bead	ohms	Degrees C
	18.076	-3.3918
	19.092	-3.9179

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/12/2014
Prepared By:	M Lotecki		

Thermistor Information

Site Name:	Powerhouse CF	Thermistor Location	V1.9
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110026	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	~~2015~~ 8/9/2012		
Battery Levels	Main 11.34V	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	11.857	5.4883
2	13.879	3.3293
3	15.520	1.0925
4	16.575	-0.2169
5	18.101	-2.0879
6	17.598	-1.5098
7	17.937	-1.9026
8	18.400	-2.3768

Bead	ohms	Degrees C
9	18.631	-2.6224
10	18.132	-2.7468

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/
Prepared By:	

Thermistor Information

Site Name: USHCN		Thermistor Location	
Thermistor Number: VT8		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07102057		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.34	Aux 13.02	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	12.553	5.1714
	13.282	4.2085
	13.364	4.1285
	14.151	2.9918
	15.463	1.1933
	16.929	-0.5396
	17.786	-1.5380
	18.653	-2.5034

Bead	ohms	Degrees C
	19.314	-3.1702
	19.906	-3.8077
	20.49	-4.3811
	20.86	-5.1396
	21.24	-5.3959
	21.48	-5.5780

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/13/2014
Prepared By:	MLotecki		

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number:	VT9	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110058	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.54	Aux	13.02

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.170	7.6903
	12.337	5.5756
	13.091	4.5278
	13.681	3.6466
	14.833	2.0100
	16.529	-0.1586
	17.262	-1.0008
	18.08	-1.9757

Bead	ohms	Degrees C
	18.69	-2.6017
	19.20	-3.1598
	19.69	-3.6688
	20.04	-4.0413
	20.40	-4.4128
	20.64	-4.6773
	20.79	-4.8391
	21.09	-5.1876

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/13/2014
Prepared By:	

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number:	V13	Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	0711 00 59	Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2012		
Battery Levels	Main 11.34	Aux 13.26	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	12.985	4.6051
	12.976	4.6700
	13.771	3.4718
	15.975	0.5073
	17.156	-0.8835
	18.068	-1.9026
	18.725	-2.6224
	19.452	-3.3526

Bead	ohms	Degrees C
	20.05	-3.9756
	20.66	-4.5502

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/13/2014
Prepared By:	Mcotech		

Thermistor Information

Site Name:	US 412 II	Thermistor Location	U411
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	07110051	Cable Serial Number	

2501 Master Key.

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Battery Installation Date	9/10/2013		
Battery Levels	Main 11.34	Aux 13.36	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	11.482	6.4694
	11.699	6.2121
	12.953	4.6151
	13.079	3.6566
	13.654	1.6887
	15.079	-0.3769
	16.724	-1.3075
	17.499	

≈ 4.5278

Bead	ohms	Degrees C
	18.28	-2.1652
	19.09	-3.0057
	19.74	-3.6871
	20.20	-4.1650

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: 8/13/2014
Prepared By:	

Thermistor Information

Site Name:		Thermistor Location	
Thermistor Number: VTBV		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial # 07110028		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☑	☐
Battery Installation Date		
Battery Levels	Main 11.34	Aux 13.38

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	10.111	9.5846
	10.287	9.6175
	10.449	8.7273
	13.498	3.8114
	14.903	1.9147
	16.512	-0.1586
	17.544	-1.3408
	19.167	-3.0427

Bead	ohms	Degrees C
	20.51	-4.4234
	21.45	-5.3451
	22.12	-5.9381
	22.32	-6.2243
	22.42	-6.3841
	22.42	-6.4140

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	AECOM	Inspection Date:	8/14/2014
Prepared By:	Mlotecki		

Thermistor Information

Site Name:	VTSC	Thermistor Location	
Thermistor Number:		Inclination	
Install Date:		First Date Event	Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #	01770053	Cable Serial Number	

Guard Brass Lock.

Thermistor Inspection

	Good	Needs Maintenance
Casing	☑	☐
Cover	☑	☐
Data Logger	☑	☐
Cable	☑	☐
Beads	☐	☑ Bead 3, 5, 6 B.d.
Battery Installation Date	8/15/2012	
Battery Levels	Main 11.34	Aux 13.38

Manual Ground Temperature Readings

Bead	ohms	Degrees C
	8.375	12.7753
	8.461	12.5453
	12.729	-96.1851
	10.317	9.1555
	14.525	-96.1851
	12.659	-96.1851
	14.684	2.1906
	17.433	-1.4013

Bead	ohms	Degrees C
	18.753	-2.6561
	19.796	-3.7500
	20.415	-4.4234
	20.88	-4.9370
	21.11	-5.2276
	21.21	-5.4387

Observations and Proposed Maintenance

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date:
Prepared By:	

Thermistor Information

Site Name:	Thermistor Location		
Thermistor Number:	Inclination		
Install Date:	First Date Event		Last Date Event
Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)	Nodal Points	
Datalogger Serial #		Cable Serial Number	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	☐	☐	
Cover	☐	☐	
Data Logger	☐	☐	
Cable	☐	☐	
Beads	☐	☐	
Battery Installation Date			
Battery Levels	Main	Aux	

Manual Ground Temperature Readings

Bead	ohms	Degrees C

Bead	ohms	Degrees C

Observations and Proposed Maintenance

Appendix C

Field Photos (on DVD)