

ANNEX C – PIN-1 SITE-SPECIFIC INFORMATION

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NOTE: ADDITIONAL INFORMATION, INCLUDING UPDATED REPORTS/RECORDS, WILL BE PROVIDED TO THE SUCCESSFUL PROPONENT FOLLOWING CONTRACT AWARD.

C. SITE SPECIFIC INFORMATION – PIN-1 CLINTON POINT

C.1 Introduction

The PIN-1 Clinton Point former auxiliary DEW Line site is located in the Northwest Territories at approximately 69° 35' 00" N, 120° 44' 46" W. The site is approximately 130 km northeast of the community of Paulatuk and is located within approximately 5 km of the Nunavut border, adjacent to Amundsen Gulf. The nearest community in the Inuvialuit Settlement Region with an aircraft charter base and a full range of commercial and public services is Inuvik, approximately 540 km to the southwest. The site is characterized by a bedrock plateau and low rolling hills with an absence of major streams or significant water features. Surface water drainage is not well defined, and tends to occur as a sheet flow over the terrain, directed into small streams that form near the coastline. The site is within the zone of continuous permafrost.

PIN-1 is accessible via charter aircraft (fixed wing or helicopter); the current condition of the runway is unknown (however, it should be noted that charter pilots who accessed the site in the summer of 2015 with a Dornier indicated that an aircraft with larger tires should be considered for future site visits due to fairly soft runway conditions). There are no North Warning System (NWS) facilities on site, nor are there any accommodations or on-site transportation. Site roads are not maintained and their condition is unknown.

PIN-1 was decommissioned in 1993, and no new NWS facilities were constructed at the site. An environmental clean-up and demolition of all facilities (with the exception of two storage buildings in the airstrip area) was completed in 2002, including closure and remediation of six landfills, as well as the construction of a new landfill for the disposal of non-hazardous wastes generated from demolition and site clean-up. Post-clean-up landfill monitoring is being carried out at the site at the following locations shown on Figure PIN-1.1:

1. Station Area Landfill – Northwest
2. Non-Hazardous Waste Landfill
3. Station Area Landfill – Southwest
4. Beach Landfill – South
5. Beach Landfill
6. Beach Landfill – North

The monitoring schedule for PIN-1 Clinton Point is provided in Table C1 below:

Table C1 – Monitoring Schedule PIN-1 Clinton Point		
No. of Years After Construction	Monitoring Event Number	Year
Prior to/During:	Baseline	1998-2001
7	6	2009
10	7	2012
15	8	2017
25	9	2027
<i>Shaded cells are those covered under this contract.</i>		

A summary of monitoring installations associated with each landfill is provided in Table C2 below:

Table C2 – Summary of Landfill Monitoring/Sampling Locations			
PIN-1 Clinton Point			
Landfill Designation/Monitoring Locations	Coordinates¹		Elevation
	North (m)	East (m)	(masl)
Station Area Landfill – Northwest			
P1-1 (soil)			
P1-2 (soil)			
P1-3 (soil)			
P1-4 (soil)			
P1-5 (soil)			
Non-Hazardous Waste Landfill			
MW-5 (soil and groundwater)			
MW-6 (soil and groundwater)			
MW-7 (soil and groundwater)			
MW-8 (soil and groundwater)			
Station Area Landfill – Southwest			
P1-6 (soil)			
P1-7 (soil)			
P1-8 (soil)			
P1-9 (soil)			
P1-10 (soil)			
Beach Landfill – South			
P1-11 (soil)			
P1-12 (soil)			
P1-13 (soil)			
Beach Landfill			
P1-14 (soil)			
P1-15 (soil)			
P1-16 (soil)			
P1-17 (soil)			
Beach Landfill – North			
MW-9 (soil and groundwater)			
MW-10 (soil and groundwater)			
MW-11 (soil and groundwater)			
MW-12 (soil ²)			
MW-13 (soil and groundwater)			
VT-1 (temperature)			
VT-2 (temperature)			
VT-3 (temperature)			
VT-4 (temperature)			
VT-5 (temperature)			
VT-6 (temperature)			
VT-7 (temperature)			
1. Coordinates of sampling/monitoring locations will be provided to the consultant following contract award.			
2. MW-12 was reported as destroyed in 2012 (likely due to a storm surge) and is no longer available for groundwater sampling.			

The following sections provide a brief description of the landfills included in the monitoring program, and the associated general monitoring requirements. Refer also to the Terms of Reference for specific monitoring requirements.

C.2 Station Area Landfill – Northwest

The Station Area Landfill – Northwest is located approximately 400 m northwest of the former module train area. No evidence of contaminated leachate or contaminated soil in excess of the remediation criteria was detected at this landfill during the assessment program.

The Station Area Landfill – Northwest was classified as a low potential environmental risk. Remediation consisted of regrading and the placement of additional fill.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil samples at the locations identified on Figure PIN-1.2.

For the 2017 monitoring event, complete a visual inspection of the landfill and soil sampling and analyses.

C.3 Non-Hazardous Waste Landfill

The Non-Hazardous Waste Landfill is located approximately 300 m east of the Station Area Landfill – Northwest. The landfill was constructed during the PIN-1 clean-up for the disposal of non-hazardous demolition and site waste. Four groundwater monitoring wells were installed around the perimeter of the landfill.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil and groundwater samples at the locations identified in Figure PIN-1.3.

For the 2017 monitoring event, complete a visual inspection of the landfill along with soil and groundwater sampling and analyses. Monitor Features Q and R closely to evaluate previously noted increases in length. Purge 3 well volumes prior to sampling MW-5, if possible.

C.4 Station Area Landfill – Southwest

The Station Area Landfill – Southwest is located approximately 400 m southwest of the former module train area. No evidence of contaminated leachate or contaminated soil in excess of the remediation criteria was detected at this landfill during the assessment program.

The Station Area Landfill – Southwest was classified as a low potential environmental risk. Remediation consisted of partial excavation at the top of a steep slope and regrading along the slope, with the placement of additional granular fill.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil samples at the locations identified on Figure PIN-1.4.

For the 2017 monitoring event, complete a visual inspection of the landfill and soil sampling and analyses. Monitor Features M1-M4 and N1-N5 closely and compare to 2012 observations to assess whether conditions are stabilizing or continue to degrade.

C.5 Beach Landfill – South

The Beach Landfill – South is located approximately 800 metres north of the north end of the airstrip. No evidence of contaminated leachate or contaminated soil in excess of the remediation criteria was detected at this landfill during the assessment program.

The Beach Landfill – South was classified as a low potential environmental risk. Remediation consisted of regrading with the placement of additional granular fill.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil samples at the locations identified in Figure PIN-1.5.

For the 2017 monitoring event, complete a visual inspection of the landfill and soil sampling and analyses.

C.6 Beach Landfill

The Beach Landfill is located approximately 200 m north of Beach Landfill – South and 1 km north of the north end of the airstrip. Some contaminated soil in excess of the remediation criteria was detected at this landfill during the assessment program.

The Beach Landfill was classified as a low potential environmental risk. Remediation consisted of removal of contaminated soil and regrading with the placement of additional granular fill, with some erosion protection in specific areas.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil samples at the locations identified in Figure PIN-1.6.

For the 2017 monitoring event, complete a visual inspection of the landfill and soil sampling and analyses.

C.7 Beach Landfill – North

The Beach Landfill – North is located approximately 1.5 km north of the north end of the airstrip, along the coastline of Amundsen Gulf. Evidence of soil contamination and leachate migration from the landfill was detected during the assessment program.

The Beach Landfill was classified as a moderate potential environmental risk. Remediation consisted of partial excavation, installation of a synthetic liner system anchored into permafrost, and placement of sufficient granular fill to promote permafrost aggradation through the landfill contents. Five monitoring wells and seven thermistors were installed at the landfill.

The long term monitoring plan consists of visual monitoring of landfill stability and the periodic collection of soil and groundwater samples and monitoring subsurface ground temperatures at the locations identified on Figure PIN-1.7.

For the 2017 monitoring event, complete a visual inspection of the landfill along with soil and groundwater sampling and analyses and thermal monitoring. Closely monitor the high water mark near the edge of landfill.

C.8 Drainage Channel

An erosion channel was regraded between the Beach Landfill – North and the Beach Landfill at the time of site clean-up to improve drainage in the area and prevent ponding. At the time of a 2015 quality assurance site inspection from the project management team, this drainage channel was observed to have undergone some degree of erosion. Refer to figure PIN-1.8 for the location of the drainage channel and nearby regraded features.

For the 2017 monitoring event, complete a visual inspection (including thorough photographic documentation) of the drainage channel and a GPS survey of this feature to allow for future monitoring of the progress of the erosion. The report should include an analysis of the stability of the drainage channel and potential risks to the Beach Landfill – North and the nearby regraded features.

C.9 Climate Normals

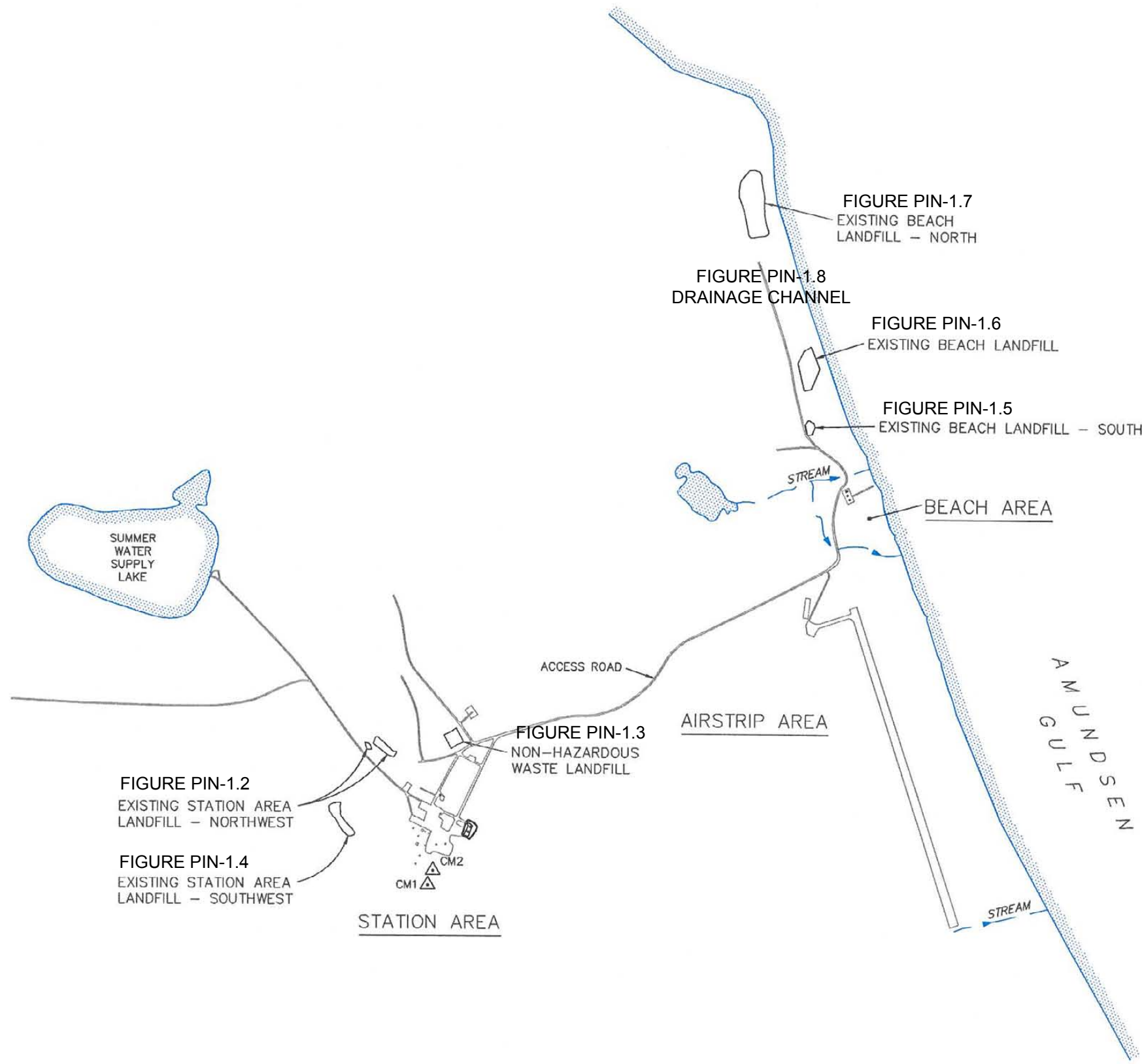
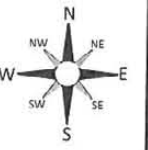
The 1961-1990 and 1971-2000 climate normals prepared by Environment and Climate Change Canada (ECCC) for Clinton Point can be found at the following links, respectively:


http://climate.weather.gc.ca/climate_normals/results_1961_1990_e.html?stnID=756&lang=e∓StationName=clinton+point&SearchType=Contains&stnNameSubmit=go&dCode=0&prov=NW&dispBack=1

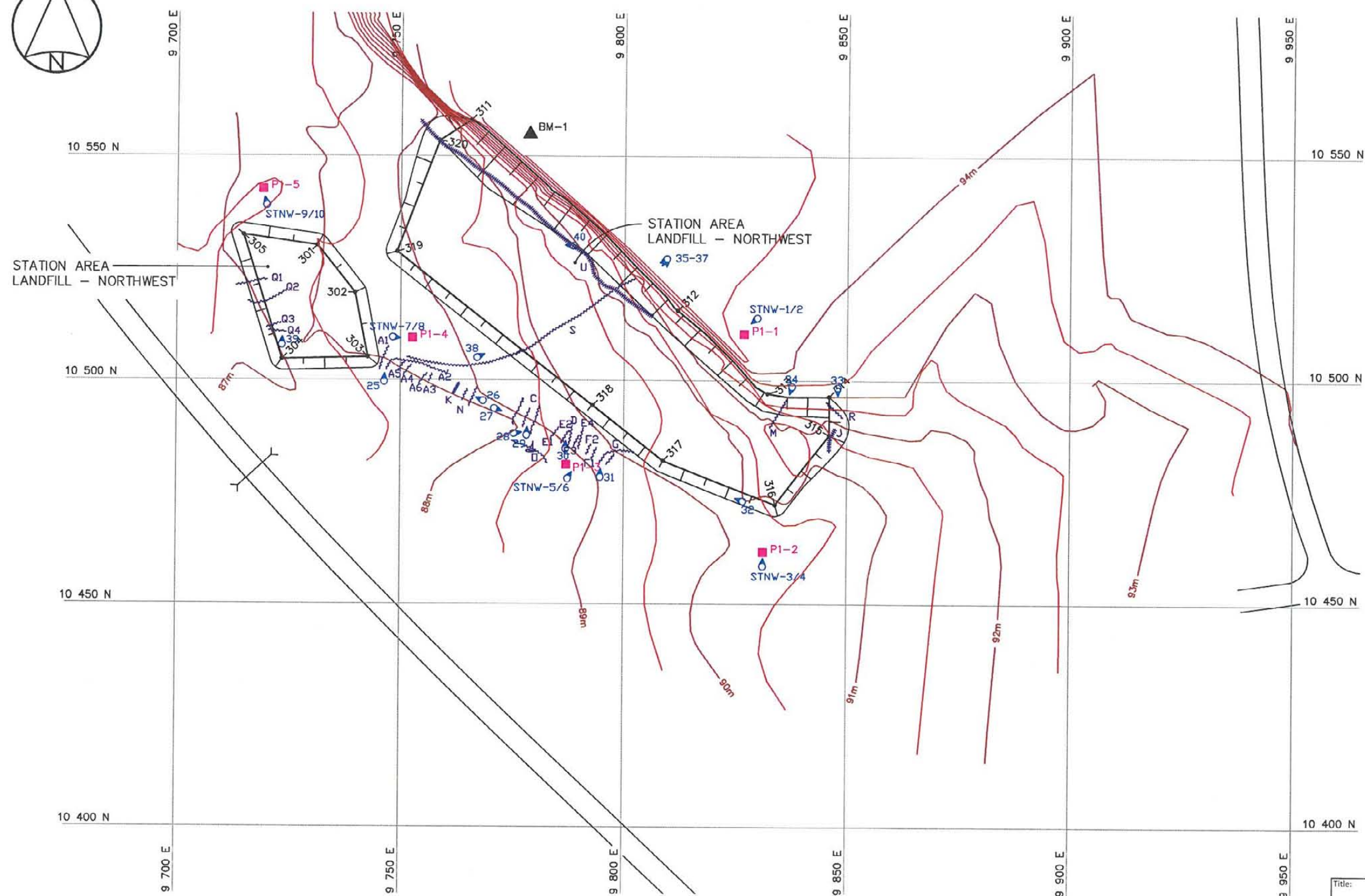
http://climate.weather.gc.ca/climate_normals/results_e.html?stnID=1637&lang=e∓StationName=clinton+point&SearchType=Contains&stnNameSubmit=go&dCode=5&dispBack=1

More recent climate normals from ECCC are not available for Clinton Point. The closest location for which more climate information is available is Kugluktuk, Nunavut. Climate normals for the 1981-2010 period for Kugluktuk can be found at the following link:

http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?stnID=1641&lang=e∓StationName=kugluktuk&SearchType=Contains&stnNameSubmit=go&dCode=1&dispBack=1



Title: Overall Site Plan - PIN - 1, Clinton Point	
 CONSULTING • ENGINEERING • TECHNOLOGIES	Project: Dew Line Clean-up Landfill Monitoring Plan
	Client: Defence Construction Canada
Date: October 2012	
1:20,000	
Figure 1	





LEGEND:

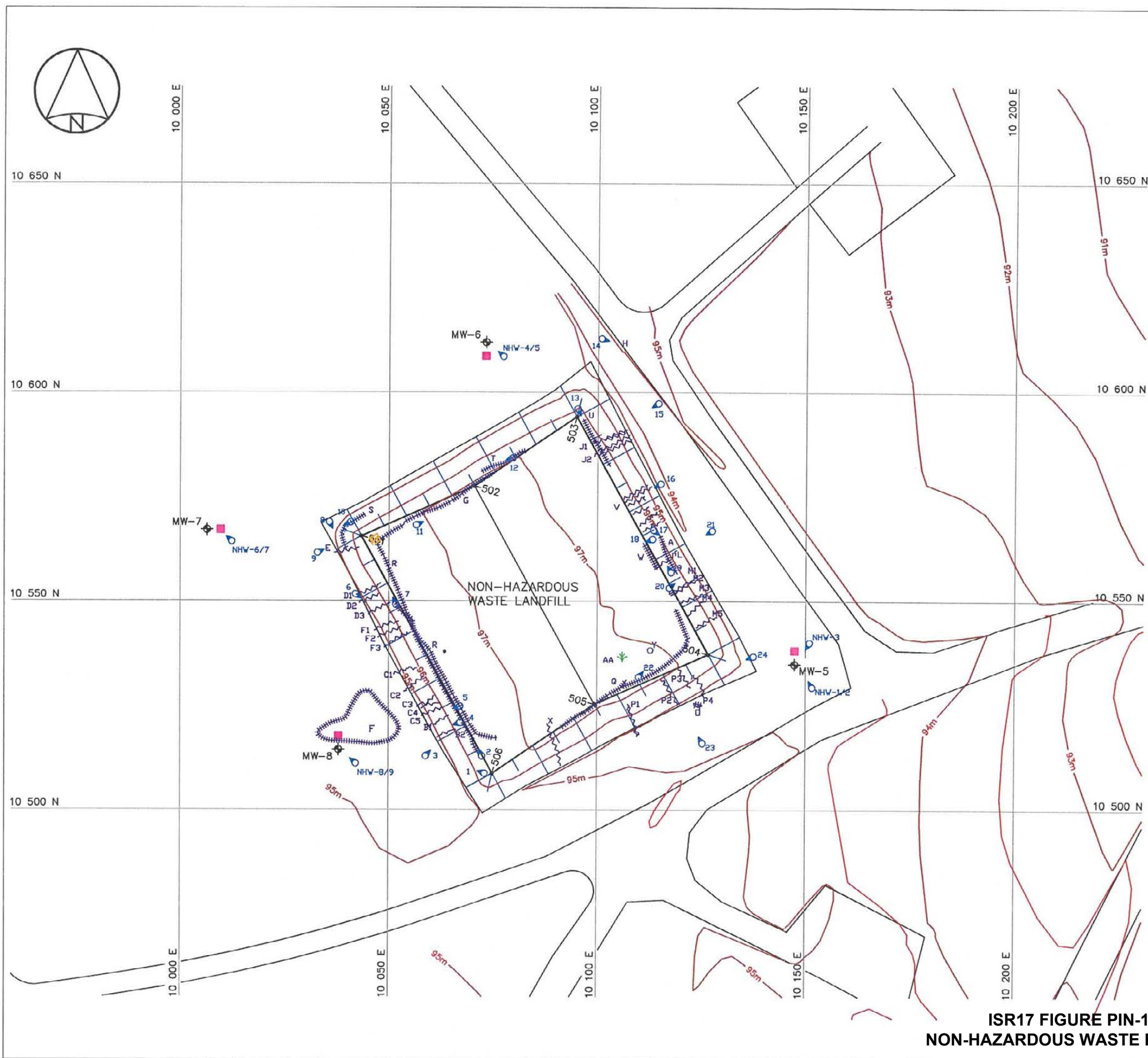
- BM-1 ▲ PERMANENT BENCHMARK
- 301- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- PHOTO LOCATION, REF. AND DIRECTION
- ~ EROSION
- CRACKING / SETTLEMENT
- ▲ EXPOSED DEBRIS

COORDINATE POINTS			
NO.	NORTHING	EASTING	ELEV.
301	10 530.3	9 731.3	N/A
302	10 519.4	9 739.7	N/A
303	10 505.1	9 742.6	N/A
304	10 504.6	9 723.4	N/A
305	10 532.3	9 714.7	N/A
311	10 558.0	9 765.6	93.0
312	10 515.6	9 812.1	93.0
313	10 497.1	9 832.2	93.0
314	10 496.4	9 846.0	93.0
315	10 487.8	9 846.1	N/A
316	10 472.3	9 834.0	N/A
317	10 482.1	9 808.8	N/A
318	10 494.4	9 793.0	N/A
319	10 528.6	9 749.1	N/A
320	10 553.5	9 758.6	N/A

PERMANENT BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-1	10 554.897	9 778.776	94.44	25mmØ STEEL PIPE

ISR17 FIGURE PIN-1.2
STATION AREA LANDFILL - NORTHWEST

Title: PIN-1 CLINTON POINT STATION AREA LANDFILL - NORTHWEST	
 CONSULTING • ENGINEERING • TECHNOLOGIES	Project: DEW LINE CLEAN-UP LANDFILL MONITORING PLAN
Date: DECEMBER 2012	Client: DEFENCE CONSTRUCTION CANADA
 SCALE 1:1000	FIGURE 2


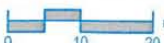


LEGEND:

- MONITORING WELL LOCATION
- 501- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- PHOTO LOCATION, REF. AND DIRECTION
- EROSION
- CRACKING / SETTLEMENT
- VEGETATION
- CONCRETE BLOCK
- SETTLEMENT HOLE

COORDINATE POINTS			
NO.	NORTHING	EASTING	ELEV.
501	10 565.5	10 043.4	97.2
502	10 577.5	10 070.4	98.1
503	10 594.1	10 095.0	97.2
504	10 537.3	10 126.5	97.2
505	10 525.3	10 099.4	98.1
506	10 508.7	10 074.9	97.2

ISR17 FIGURE PIN-1.3
NON-HAZARDOUS WASTE LANDFILL

Title: PIN-1 CLINTON POINT NON-HAZARDOUS WASTE LANDFILL	
 <p>FRANZ ENVIRONMENTAL INC. CONSULTING • ENGINEERING • TECHNOLOGIES</p>	Project: DEW LINE CLEAN-UP LANDFILL MONITORING PLAN
Date: DECEMBER 2012	Client: DEFENCE CONSTRUCTION CANADA
 <p>SCALE 1:1000</p>	FIGURE 3




LEGEND:

- 210- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- 📍 PHOTO LOCATION, REF. AND DIRECTION
- ~ EROSION
- ||||| CRACKING / SETTLEMENT
- 🗑 EXPOSED DEBRIS
- DITCH
- 📦 CONCRETE BLOCK

COORDINATE POINTS LANDFILL REGRADING			
NO.	NORTHING	EASTING	ELEV.
210	10 276.6	9 608.4	N/A
214	10 269.5	9 607.2	N/A
218	10 260.2	9 605.6	85.5
219	10 247.3	9 605.6	N/A
220	10 233.5	9 612.9	N/A
221	10 223.0	9 587.4	N/A
222	10 247.9	9 570.9	N/A
223	10 256.8	9 569.7	79.1
224	10 264.9	9 568.7	N/A
225	10 274.7	9 583.0	N/A
226	10 159.4	9 672.5	90.1
227	10 158.3	9 671.7	90.0
228	10 165.9	9 661.3	89.3
229	10 176.0	9 648.6	88.1
230	10 218.8	9 615.7	86.4

Title: PIN-1 CLINTON POINT
STATION AREA LANDFILL - SOUTHWEST



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INC.

CONSULTING • ENGINEERING • TECHNOLOGIES

Date: DECEMBER 2012

Project: DEW LINE CLEAN-UP
LANDFILL MONITORING PLAN

Client: DEFENCE CONSTRUCTION
CANADA


SCALE 1:1000

FIGURE 4


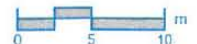
ISR17 FIGURE PIN-1.4
STATION AREA LANDFILL - SOUTHWEST

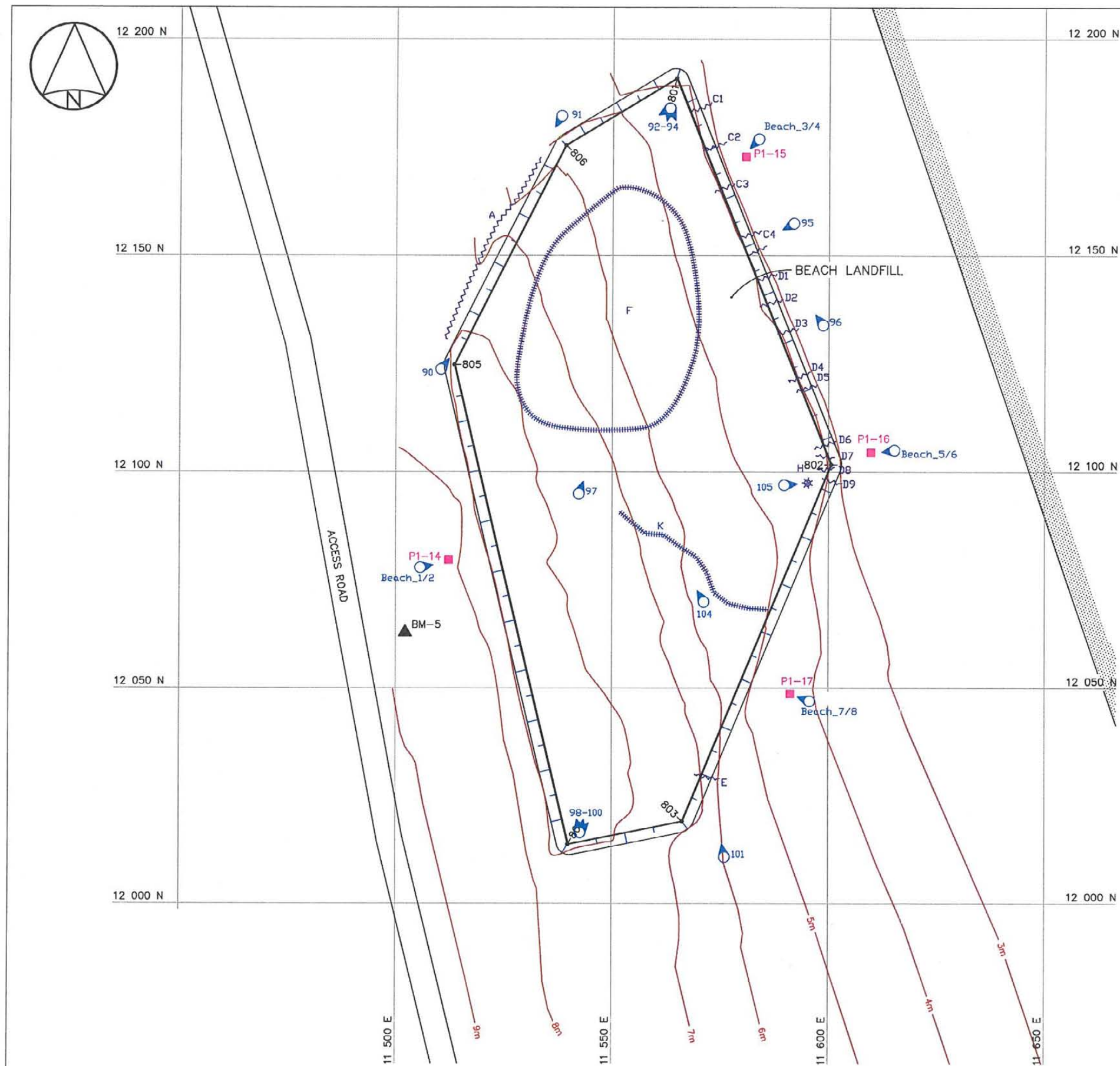


- LEGEND:
- 807-→ COORDINATE POINT
 - MONITORING SOIL SAMPLE LOCATION
 - 📍 PHOTO LOCATION, REF. AND DIRECTION
 - 📏 CONCRETE BLOCK

COORDINATE POINTS		
NO.	NORTHING	EASTING
807	11 884.8	11 559.2
808	11 874.7	11 578.0
809	11 859.0	11 583.3
810	11 831.4	11 572.5
811	11 827.1	11 555.2
812	11 869.6	11 546.3

ISR17 FIGURE PIN-1.5
BEACH LANDFILL - SOUTH

Title: PIN-1 CLINTON POINT BEACH LANDFILL - SOUTH	
 FRANZ ENVIRONMENTAL INC. <small>CONSULTING • ENGINEERING • TECHNOLOGIES</small>	Project: DEW LINE CLEAN-UP LANDFILL MONITORING PLAN
	Client: DEFENCE CONSTRUCTION CANADA
Date: DECEMBER 2012	
 SCALE 1:500	
FIGURE 5	





LEGEND:

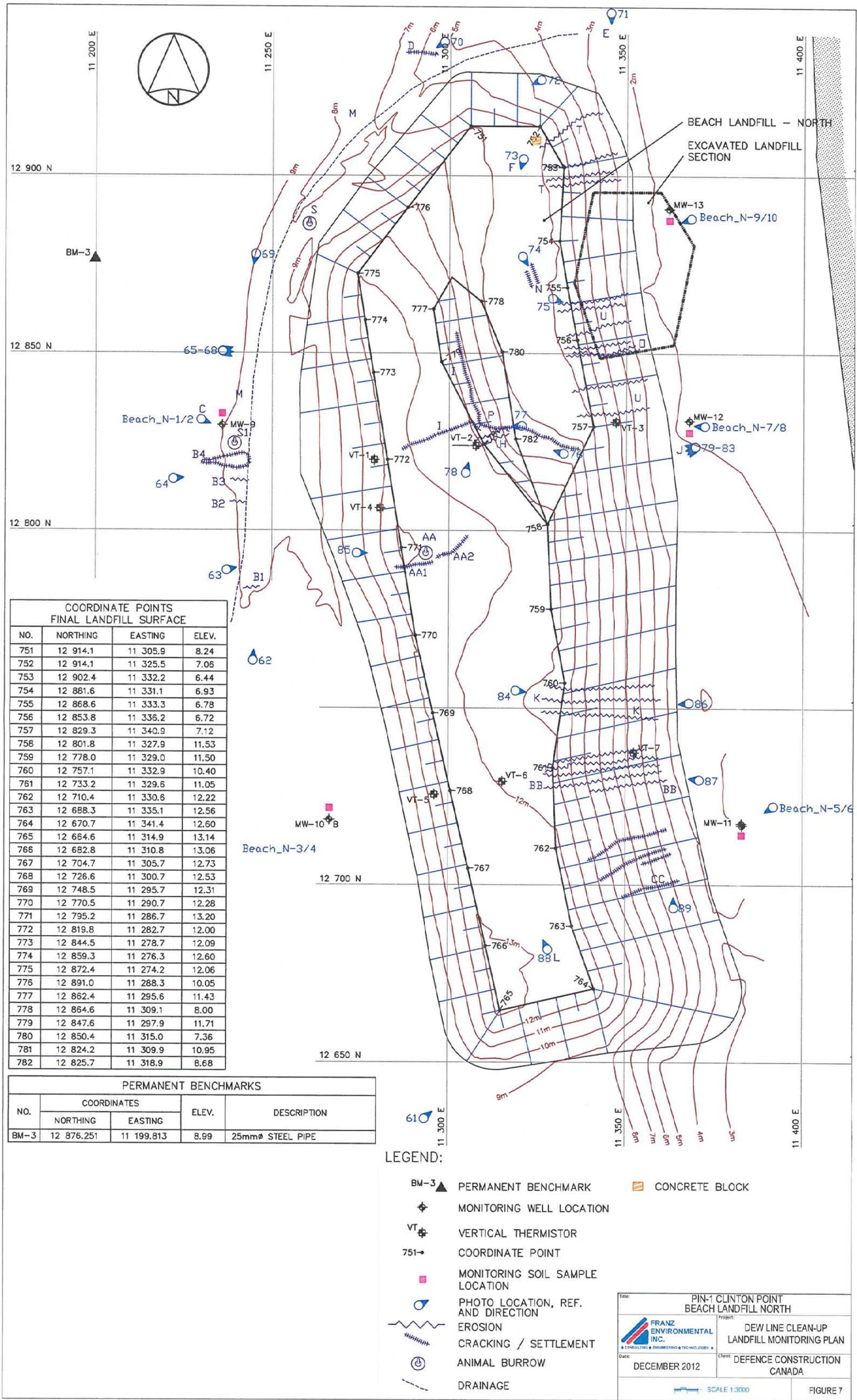
- ▲ BM-5 PERMANENT BENCHMARKS
- 801→ COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- 👁 PHOTO REFERENCE
- ~ EROSION
- ⚡ CRACKING / SETTLEMENT
- ⊗ SETTLEMENT HOLE

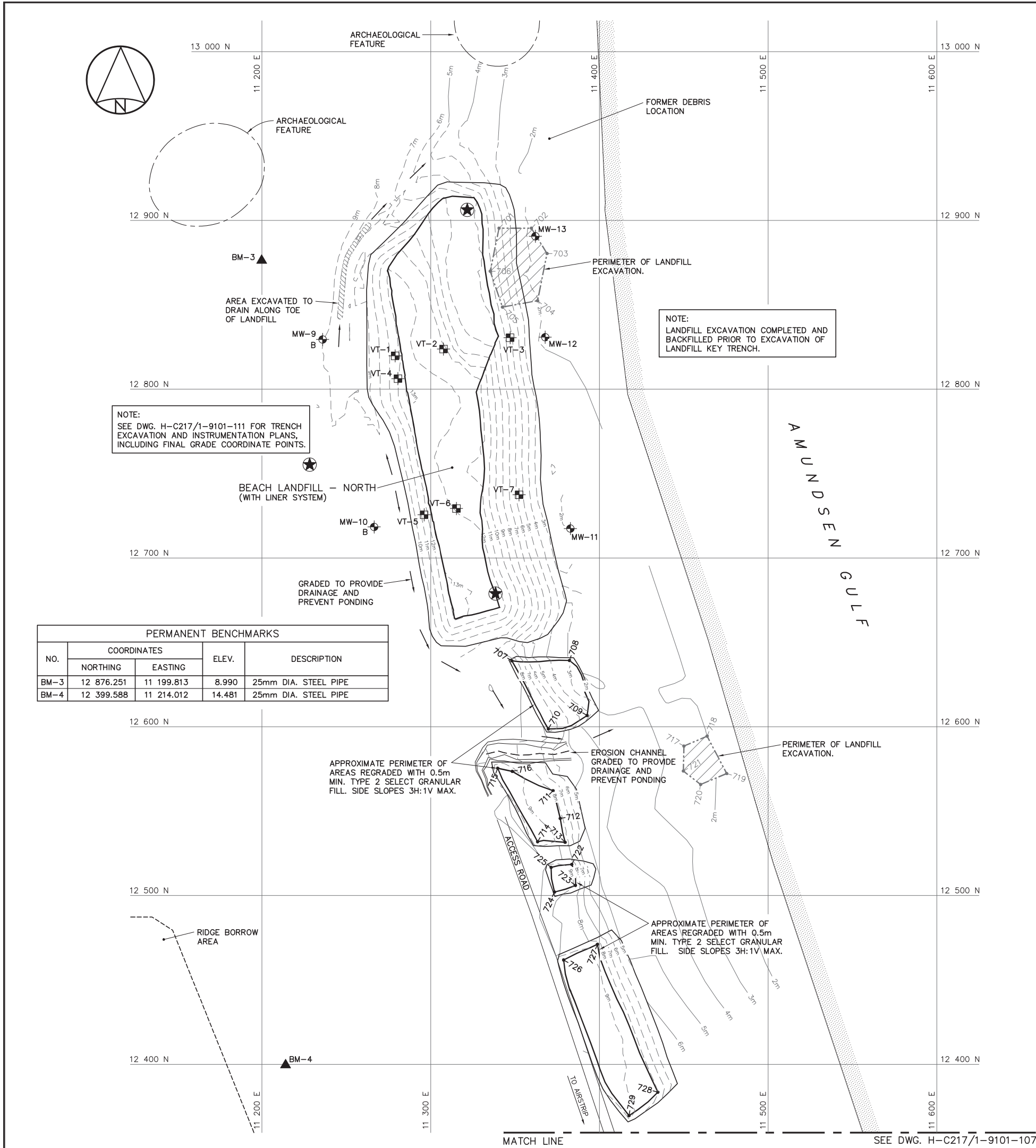
COORDINATE POINTS		
NO.	NORTHING	EASTING
801	12 190.9	11 564.6
802	12 101.7	11 600.6
803	12 019.0	11 566.3
804	12 013.7	11 539.9
805	12 124.8	11 513.6
806	12 175.5	11 539.2

PERMANENT BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-5	12 062.837	11 502.262	8.68	25mmØ STEEL PIPE

ISR17 FIGURE PIN-1.6
BEACH LANDFILL

Title: EXISTING BEACH LANDFILL PIN-1, CLINTON POINT	
 <p>FRANZ ENVIRONMENTAL INC. CONSULTING • ENGINEERING • TECHNOLOGIES</p>	Project: DEW LINE CLEAN-UP LANDFILL MONITORING PLAN
Date: DECEMBER 2012	Client: DEFENCE CONSTRUCTION CANADA
 <p>SCALE 1:1000</p>	
FIGURE 6	





NOTE:
FOR DETAILS REGARDING CONFIRMATORY TESTING INFORMATION, REFER TO FINAL REPORTS PREPARED BY THE ENVIRONMENTAL SCIENCES GROUP, ROYAL MILITARY COLLEGE, DATED FEBRUARY, 2002 AND APRIL, 2003.

NOTE:
CONTOURS SHOWN AS DASHED LINES WERE GENERATED FROM SURVEY INFORMATION AND REPRESENT FINISHED GROUND SURFACE FOLLOWING REGRADING.

NOTE:
THIS DRAWING HAS BEEN REPLOTED FOR RECORD DRAWING PURPOSES FROM INFORMATION SUPPLIED BY DEFENCE CONSTRUCTION CANADA IN OCTOBER, 2002.
CONTRACT DRAWINGS INCLUDE THE ENGINEER'S STAMP.

COORDINATE POINTS (DESIGN) LANDFILL EXCAVATION			
NO.	NORTHING	EASTING	
701	12 895.4	11 340.5	
702	12 895.4	11 359.7	
703	12 880.4	11 369.0	
704	12 852.4	11 363.3	
705	12 848.7	11 342.5	
706	12 869.9	11 335.3	

COORDINATE POINTS (AS-BUILT) REGRADING AREAS			
NO.	NORTHING	EASTING	ELEV.
707	12 639.1	11 348.1	8.7
708	12 639.3	11 382.3	3.1
709	12 606.7	11 392.7	4.4
710	12 598.7	11 369.7	7.4
711	12 562.1	11 372.5	8.0
712	12 545.7	11 376.8	8.4
713	12 531.6	11 379.7	8.7
714	12 531.8	11 363.4	9.4
715	12 575.4	11 339.8	9.4
716	12 573.6	11 348.4	9.4
722	12 518.4	11 383.6	8.8
723	12 506.0	11 385.9	8.9
724	12 502.1	11 373.4	9.4
725	12 516.7	11 371.4	9.3
726	12 461.8	11 378.8	9.4
727	12 471.1	11 398.8	8.5
728	12 383.5	11 434.6	8.1
729	12 369.6	11 417.6	9.2

COORDINATE POINTS (DESIGN) LANDFILL EXCAVATION		
NO.	NORTHING	EASTING
717	12 588.5	11 450.1
718	12 594.4	11 463.8
719	12 572.3	11 475.5
720	12 565.8	11 460.0
721	12 573.8	11 449.7

ISR17 FIGURE PIN-1.8
DRAINAGE CHANNEL

National
Defence

Défense
nationale

Headquarters
Quartier général

General Notes:

1. ALL ELEVATIONS ARE REFERENCED TO PIN-1 AS-BUILT DWG. AAP-2.

2. ALL NON-HAZARDOUS DEBRIS WITHIN PLAN AREA WAS PLACED IN STATION AREA NON-HAZARDOUS WASTE LANDFILL.

3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

4. HORIZONTAL CONTROL REFERENCED TO SURVEY CONTROL MONUMENTS.

5. FOR MONITORING WELL INSTALLATION DETAILS AND SURVEYED COORDINATES, SEE DWG. H-C217/1-9101-121.

6. FOR PERMANENT SURVEY CONTROL (BENCHMARK) INSTALLATION DETAILS SEE DWG H-C217/1-9101-121.

Legend:

COORDINATE POINT

MONITORING WELL LOCATION (3)

BACKGROUND MONITORING WELL LOCATION (2)

VT-1 VERTICAL THERMISTOR INSTALLATION (7)

BM-3 PERMANENT BENCHMARK LOCATION (2). (SEE NOTE 6)

LANDFILL EXCAVATION AREA

BODY OF WATER

MONITORING PHOTOGRAPH REFERENCE MARKER

1

07-10-31

AS-BUILT DRAWING

RRM

No.

DATE

REVISION

REVISION

APPR.

DRAFT

UMA

AECOM

HATCH

SCALE - ECHELLE

20

10

0

20

40

60m

PROJECT - PROJET

PIN-1 CLINTON POINT

DEW LINE CLEAN UP

© COPYRIGHT
HER MAJESTY THE QUEEN IN RIGHT OF
CANADA 2007, AS REPRESENTED BY THE
MINISTER OF NATIONAL DEFENCE.

TRADE - METIER

SITING

DATE

2001-02-09

SUBJECT - SUJET

BEACH AREA - NORTH
SITE PLAN

PRODUCTION

CONCURRENCE - ASSENTIMENT

DESIGNED
ETUDIE

GE/RRM

DES OFF
AGENT CONCEPT

DRAWN
DESSINE

CAE/IR

SECT HD
CHEF SECT

CHECKED
VERIFIE

TMS

DES MGR
GEST CONCEPT

COORDINATION

SMS

REVIEWED - REVU

DWG. NO. - DESSIN NO.

H-C217/1-9101-106

Canada