

2011 Annual Geotechnical Inspection, Boston Advanced Exploration Project, Hope Bay, Nunavut

Report Prepared for

Hope Bay Mining Ltd



Report Prepared by



SRK Consulting (Canada) Inc.
1CH008.046
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Executive Summary

The Boston Advanced Exploration Project (Boston Camp) is a wholly owned exploration camp of Hope Bay Mining Ltd. (HBML), which is a wholly owned subsidiary of Newmont Mining Company (NMC). The camp is located about 170 km southwest of Cambridge Bay within the western Kitikmeot Region, Nunavut (with general coordinates of latitude 67°39'N and longitude 106°22'W). Boston Camp is used on a seasonal basis from which to carry out prospecting and exploration, various forms of exploration drilling, core splitting and logging. In addition, the site has historically been subjected to bulk underground sampling and processing. The camp was temporarily closed between mid- 2009 and mid- 2010, pending improvements to the camp sewage treatment plant (STP). At the time of this inspection the camp was open and in use.

Site operations are currently conducted under Nunavut Water Board (NWB) License 2BB-BOS0712, dated July 6, 2007, which entitles HBML to use water and dispose of waste associated with their operations. HBML contracted SRK Consulting (Canada) Inc. (SRK) to conduct the annual geotechnical site inspection of Boston Camp in accordance with stipulated License conditions. This investigation was carried out during the week of July 25 – 29, 2011.

Table A below provides a summary of the inspection components and the primary recommendations stemming from the inspection. These recommendations are compared with those listed in the 2010 annual geotechnical report (SRK 2011a). There are no issues that require urgent and immediate action. SRK understands that HBML have already initiated projects to address many of the recommendations and concerns raised in this report.

Table A: Summary of Inspection Items and Associated Inspection Recommendations

Inspection Item	2010 Recommendations	2011 Recommendations
Thermistors	<ul style="list-style-type: none"> Locate appropriate readout device for older thermistors and confirm functionality of strings Splice broken string Confirm status of string in 08SBD381A Continue formal monitoring of new (and older) strings 	<ul style="list-style-type: none"> Locate appropriate readout device for older thermistors and confirm functionality of strings Consider splicing broken string Confirm status of string in 08SBD381A Continue formal monitoring of new (and older) strings
Primary Tank Farm Settlement Monitoring	<ul style="list-style-type: none"> Continue quarterly monitoring Recognize foundation settlement risk in spill response plan 	<ul style="list-style-type: none"> Cease quarterly monitoring, but monitor once per year in July or August Recognize foundation settlement risk in spill response plan
Primary Tank Farm	<ul style="list-style-type: none"> Monitor the surficial slip surfaces on the tank farm berms Continue settlement monitoring as described above 	<ul style="list-style-type: none"> Monitor the surficial slip surfaces on the tank farm berms Continue settlement monitoring as described above
Power Plant Fuel Containment	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
Central Pad Fuel Containment	<ul style="list-style-type: none"> No action required Confirm whether secondary containment is required for two new tanks and implement if necessary 	<ul style="list-style-type: none"> No action required

Inspection Item	2010 Recommendations	2011 Recommendations
Jet Fuel Containment	<ul style="list-style-type: none"> Conduct regular inspections of the portable containment berms 	<ul style="list-style-type: none"> Conduct regular inspections of the portable containment berms Confirm whether secondary containment is required for additional drums and implement if necessary
Solid Waste Disposal Site (including burn pit)	<ul style="list-style-type: none"> Confirm that waste containment is not required through an appropriate waste inventory Clean out burn pit and dispose of wood waste as appropriate Remediate burn pit, or reclassify for other functional use 	<ul style="list-style-type: none"> Confirm that waste containment is not required through an appropriate waste inventory
Ore Stockpiles	<ul style="list-style-type: none"> Implement the 2009 water and ore/ waste rock management plan developed for the site 	<ul style="list-style-type: none"> Implement the 2009 water and ore/ waste rock management plan developed for the site
Settling Pond	<ul style="list-style-type: none"> Clear out debris in pond that could damage liner Implement the 2009 water and ore/ waste rock management plan developed for the site Construct suitable barrier around the pond to prevent inadvertent human and/ or animal access Confirm through water quality sampling whether the pond is leaking, and implement mitigation measures as appropriate 	<ul style="list-style-type: none"> Clear out debris in pond that could damage liner Implement the 2009 water and ore/ waste rock management plan developed for the site Construct suitable barrier around the pond to prevent inadvertent human and/ or animal access Confirm through water quality sampling whether the pond is leaking, and implement mitigation measures as appropriate Repair liner
Soil Containment Berm (Landfarm)	<ul style="list-style-type: none"> Implement action items arising from landfarm study recently completed 	<ul style="list-style-type: none"> Relocate hydrocarbon contaminated materials and remediate site
Diamond Drill Cuttings and Settling Pond	<ul style="list-style-type: none"> Develop appropriate remediation plan for the pond Develop appropriate management plan for storage of drill cuttings, including possible use as remediation method for permafrost degradation zones 	<ul style="list-style-type: none"> Develop appropriate remediation plan for the pond Develop appropriate management plan for storage of drill cuttings, including possible use as remediation method for permafrost degradation zones
Portal	<ul style="list-style-type: none"> Replace the faded notices at the portal entrance advising of the dangers associated with unauthorized access to the area Develop site specific hazard assessment for people entering the portal area to address the rockfall hazard Consider installing a small diameter wire mesh over the exposed section of the portal roof to address the rockfall hazard 	<ul style="list-style-type: none"> Replace the faded notices at the portal entrance advising of the dangers associated with unauthorized access to the area Develop site specific hazard assessment for people entering the portal area to address the rockfall hazard Consider installing a small diameter wire mesh over the exposed section of the portal roof to address the rockfall hazard
Vent Raise	<ul style="list-style-type: none"> Replace weathered protective tarps covering the shelter erected over the vent raise Install notices at the vent raise advising of the dangers associated with unauthorized access to the area 	<ul style="list-style-type: none"> Replace weathered protective tarps covering the shelter erected over the vent raise Install notices at the vent raise advising of the dangers associated with unauthorized access to the area

Inspection Item	2010 Recommendations	2011 Recommendations
Road to Dock	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures
Camp Complex Foundation Pad	<ul style="list-style-type: none"> Re-survey the pad and develop an action plan to fill in and re-grade the pad to re-establish constant pad drainage 	<ul style="list-style-type: none"> Re-survey the pad and develop an action plan to fill in and re-grade the pad to re-establish constant pad drainage
Road to Airstrip	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures
Airstrip	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Conduct frequent walk-over surveys to inspect for tension cracks along the airstrip shoulder 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Conduct frequent walk-over surveys to inspect for tension cracks along the airstrip shoulder
Drill Road	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures
Core Storage Road	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Monitor the pipe culvert for progressive permafrost degradation Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Monitor the pipe culvert for progressive permafrost degradation Implement speed control measures
Wooden Walkway to Boat Dock	<ul style="list-style-type: none"> Consider raising the walkway above the tundra to prevent vegetation dieback and possible onset of permafrost degradation If boat dock is to be decommissioned, consider removing the walkway altogether 	<ul style="list-style-type: none"> Completely remove the dock and walkway if there are no plans to re-commission the dock
Radio Tower and Shack	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
Water Intake Pump Shack	<ul style="list-style-type: none"> Consider installing thermal pad or other appropriate foundation system 	<ul style="list-style-type: none"> Consider installing thermal pad or other appropriate foundation system
Existing STP Foundation Pad	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
New STP Foundation Pad	<ul style="list-style-type: none"> Monitor the areas where tundra vegetation damage has occurred Develop long-term re-vegetation plan; involve a tundra vegetation expert 	<ul style="list-style-type: none"> Monitor the areas where tundra vegetation damage has occurred Develop long-term re-vegetation plan; involve a tundra vegetation expert
Core Storage Area(s)	<ul style="list-style-type: none"> Consolidate core box storage and ensure that no boxes are inadvertently stored on the tundra Develop a long-term core storage plan 	<ul style="list-style-type: none"> Consolidate core box storage and ensure that no boxes are inadvertently stored on the tundra Develop a long-term core storage plan

Inspection Item	2010 Recommendations	2011 Recommendations
Grey Water Discharge	<ul style="list-style-type: none"> Implement the new sewage management plan developed for the site when the new STP is commissioned 	<ul style="list-style-type: none"> Implement the new sewage management plan developed for the site
Drill Sites	<ul style="list-style-type: none"> Develop remediation strategy to prevent further permafrost degradation 	<ul style="list-style-type: none"> Develop remediation strategy to prevent further permafrost degradation
Vegetation Dieback Zone	<ul style="list-style-type: none"> Initiate study to determine why dieback continues; involve a tundra vegetation expert Develop remediation strategy to prevent further dieback and permafrost degradation 	<ul style="list-style-type: none"> Initiate study to determine why dieback continues; involve a tundra vegetation expert Develop remediation strategy to prevent further dieback and permafrost degradation
V-Notch Weir	<ul style="list-style-type: none"> Conduct complete inspection of the weir during 2011 geotechnical inspection Develop appropriate remediation plan for the weir 	<ul style="list-style-type: none"> Conduct complete inspection of the weir during 2011 geotechnical inspection Develop appropriate remediation plan for the weir
Salt-burn Area	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Continue developing and subsequently implement an appropriate remediation plan for remediation of this site

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Appendix A Boston Primary Fuel Tank Farm Settlement Monitoring

1 Introduction and Scope of Report

1.1 Inspection Requirement

The Boston Advanced Exploration Project (Boston Camp) is an exploration camp of Hope Bay Mining Limited (HBML), a wholly owned subsidiary of Newmont Mining Company (NMC). The camp is located about 170 km southwest of Cambridge Bay within the western Kitikmeot Region, Nunavut (with general coordinates of latitude 67°39'N and longitude 106°22'W, as shown in Figure 1).

The Boston Camp is currently used on a seasonal basis from which to carry out prospecting and exploration, various forms of exploration drilling, core splitting and logging. In addition, the site has historically been subjected to bulk underground sampling and processing.

Site operations are currently conducted under Nunavut Water Board (NWB) License 2BB-BOS0712 (the License), dated July 6, 2007, which entitles HBML (the Licensee) to use water and dispose of waste associated with their operations. Part D, Item 20 of the License (NWB 2007) states the following:

“An inspection of the earthworks, geological regime, and the hydrological regime of the Project is to be carried out annually during the summer by a Geotechnical Engineer. The Geotechnical Engineer’s report shall be submitted to the Board within sixty (60) days of the inspection, with a covering letter from the Licensee outlining an implementation plan to respond to the Engineer’s recommendations.”

Additionally, Part D, Item 10 states:

“The Licensee shall ensure that Containment Ponds are designed and bermed in such a way to ensure there is no seepage. A report on seepage shall be included as part of the Geotechnical Engineer’s annual report required by Part D, Item 20.”

In fulfillment of these regulatory requirements, Mr. Chris Hanks, Director for Environment and Social Responsibility from HBML, requested that SRK Consulting (Canada) Inc. (SRK) conduct the 2011 geotechnical site inspection. This report provides a summary of the conditions observed and the resulting mitigation recommendations. Table 1 provides a summary of the inspection components.

Table 1: List of Individual Inspection Items

Facility/Data Type	Inspection Item
Instrumentation/Data	Thermistors
	Primary Tank Farm Settlement Surveys
Containment Structures	Primary Tank Farm
	Power Plant Fuel Containment
	Central Pad Fuel Containment
	Jet Fuel and Lubricant Containment
	Solid Waste Disposal Site (including Burn Pit)
	Ore/ Waste Rock Stockpiles
	Settling Pond
	Soil Containment Berm (Landfarm)
	Diamond Drill Cuttings and Settling Pond
Mine Openings	Portal
	Vent Raise
Infrastructure	Road to Dock
	Camp Complex Foundation Pad
	Road to Airstrip
	Airstrip
	Drill Road
	Core Storage Road
	Wooden Walkway to Boat Dock
	Radio Tower and Shack
	Water Intake Pump Shack
	Existing STP Foundation Pad
	New STP Foundation Pad
Other Areas	Core Storage Area(s)
	Grey Water Discharge
	Drill Sites
	Vegetation Dieback Zones
	V-Notch Weir
	Salt-burn Area

Four previous formal geotechnical inspections in fulfillment of the Water Licence Condition have been carried out. These were in October 2007 (SRK 2008), July 2008 (SRK 2009a), July 2009 (SRK 2009f) and July 2012 (SRK 2011a). This report describes the fifth formal annual geotechnical inspection.

1.2 Report Structure

Section 2 of this report provides a brief summary of the site history and physical conditions to provide context for the report content. The inspection conditions are described in Section 3 and an

overall summary of recommendations is provided in Section 4. Photos representing the inspection conditions are included as Figures and supporting settlement monitoring data is included as Appendix A.

1.3 Disclaimer

This report and the opinions and conclusions contained herein ("Report") contains the expression of the professional opinion of SRK as to the matters set out herein, subject to the terms and conditions of the agreement dated September 2008, HBML Professional Services Agreement (HBML.BOC-CM.PSA.003) (the "Agreement") between SRK and Hope Bay Mining Ltd. ("HBML"), the methodology, procedures and sampling techniques used, SRK's assumptions, and the circumstances and constraints under which Services under the Agreement were performed by SRK. This Report is written solely for the purpose stated in the Agreement, and for the sole and exclusive benefit of HBML, whose remedies are limited to those set out in the Agreement. This Report is meant to be read as a whole, and sections or parts thereof should thus not be read or relied upon out of context. In addition, this Report is based in part on information not within the control of SRK. Accordingly, use of such Report shall be at the user's sole risk. Such use by users other than HBML and its corporate affiliates shall constitute a release and agreement to defend and indemnify SRK from and against any liability (including but not limited to liability for special, indirect or consequential damages) in connection with such use. Such release from and indemnification against liability shall apply in contract, tort (including negligence of SRK whether active, passive, joint or concurrent), strict liability, or other theory of legal liability; provided, however, such release, limitation and indemnity provisions shall be effective to, and only to, the maximum extent, scope or amount allowable by law.

2 Site Conditions

2.1 Site History

A brief summary of the site history is listed in Table 2.

Table 2: Summary of Pertinent Site Ownership History

Period	Comment
1964	Sporadic exploration in the Hope Bay area begins, resulting in several gold and silver showings including Ida Point, Ida Bay and Roberts Lake.
1970	Roberts Bay Mining explores the area for about a decade up to 1980.
1977	Noranda begins exploring for volcanogenic massive sulphide deposits. They leave the belt in 1990. Prior to 1980, Roberts Bay Mining also explored the area.
1987	Abermin Corporation stake claims in the vicinity of Spyder and Doris Lakes. After completing some exploration they allow their claims to expire.
1988	BHP Minerals Canada Inc. (BHP) explores the southern portion of Hope Bay Volcanic Belt.
1991	BHP acquires a contiguous block of claims covering about 1,106 square kilometres.
1992	BHP commences exploration drilling at the Boston property.
1993	The first camp is constructed on the southwest shores of Spyder Lake by BHP.
1994	Construction of 35 person camp at Stickleback Lake. The Spyder Lake camp is dismantled and moved to this site.
1996 and 1997	BHP complete 2,300 m of underground development, underground exploration (drilling and sampling) and bulk sampling of the Boston deposit.
1999	BHP sells all its interests in the Hope Bay Belt to Hope Bay Joint Venture (HBJV), a 50:50 joint venture between Hope Bay Gold Corporation Inc. (formerly Cambiex Exploration Inc.), and Miramar Hope Bay Limited (MHBL), a wholly owned subsidiary of Miramar Mining Corporation (MMC).
2002	Hope Bay Gold Corporation Inc. formerly merges with MMC, and the Hope Bay site is operated under MHBL.
2008	Hope Bay Mining Limited (HBML), a wholly owned subsidiary of Newmont Mining Corporation (NMC) buys out all interests in the Hope Bay Belt from MMC. HBML assumes responsibility of the camp and Water Licence for Boston.
2009 to 2010	The camp is temporarily closed pending upgrades to the sewage treatment plant.
2011	Camp re-opens as a seasonal exploration camp.

2.2 Site Infrastructure

The Boston Camp is situated on a ridge and is comprised of a peninsula extending northwards into Spyder Lake, as illustrated on Figure 2. The main camp footprint spans about 325 m from north to south, and 150 m east to west. The bulk of the camp facilities are located on a crushed rock pad, ranging in thickness from 0.6 m to 3 m. The pad was designed to slope generally north at a gradient of about 1%.

The camp consists of a series of joined trailers to provide accommodations and office space for about 50 people. One trailer houses the water treatment plant and another, off the main pad, the original sewage treatment plant (STP). A new STP is currently under construction, and will ultimately replace the existing facility. There are six tents that act as additional office space and core

logging shacks. A “Weatherhaven” type building, that was used to contain the bulk sampling crushing plant, is now used as a workshop and a general equipment storage shed. The last remaining buildings consist of a maintenance shop and the power generator shed. Generator fuel (diesel) is supplied from two aboveground storage tanks, adjacent to the power house. Eight additional bulk fuel tanks are housed in an engineered containment facility.

An overall site layout plan is presented in Figure 2, and a more detailed illustration of the main camp complex is presented in Figures 3 and 4 (note Figures 3 and 4 are based on the July 2010 site layout). In addition to the main camp complex, these figures illustrate the relative locations of all the main infrastructure components, containment structures and mine openings.

2.3 Climate

Site specific climate data at Boston Camp is limited to a few years of data collected by BHP in the late 1990s. Comparison of this data, with regional weather stations operated by Environment Canada, suggests that the mean annual site temperature is about -13.5°C. The extrapolated mean annual precipitation is about 208 mm, with 108 mm of that falling as rain and the remainder as snow. The area is classified as arctic desert (EBA 1997).

2.4 Regional Geology

During the Quaternary period, the region was subjected to multiple glaciations. The northwestern sector of the vast Laurentide Ice Sheet covered the area during each glaciation, and the present day landscape provides clear evidence of the most recent (Late Wisconsin) glaciation. Striations, orientation of eskers, grooves and drumlins indicate that the predominant glacial ice movement was north-northwest (EBA 1996).

The ice disappeared about 8,800 years ago leaving a blanket of basal till. The sea level was about 200 m higher than present immediately following de-glaciation. At that time, the project area was submerged and the edge of the ice sheet abutted the open sea. Melt water streams from the ice carried fine grained sediments towards the sea, resulting in the accumulation of marine sediments on top of the till, with the greatest accumulation in deeper water zones, which now form the valley bottoms (EBA 1996).

Isostatic rebound after de-glaciation resulted in emergent landforms, and during this process all parts of the land were washed by waves. The easily erodible marine sediments, till and glacio-fluvial sands and gravels were subsequently reworked by waves, currents and sea ice. This has resulted in the present day outcrops where thin soil veneers were washed off the uplands and deposited in the valley bottoms. Since emergence, the natural effects of slope processes, frost action and permafrost have transformed the landscape to its present day shape (EBA 1996).

2.5 Permafrost and Geotechnical Conditions

Surficial geotechnical investigations at the Boston project area are limited to a series of seven drill holes and a subsequent terrain analysis carried out by EBA Engineering Consultants Ltd. (EBA) in 1996 (EBA 1996, 1997). There is also a series of thermistors that have been installed at the site including three shallow strings in 1996 (EBA 1996), one deep string in 1997 (EBA 1997; Golder 2000a, b), and three deep strings in 2008 (SRK 2009e). A Westbay well was installed in 2010 (SRK 2011b), which allows recording of down hole water temperature during pumping. The

location of all surficial geology drill holes and thermistor string locations are presented in Figure 2, and summarized in Table 3.

Table 3: Summary of Permafrost Drillholes and Thermistor Installations

Drill Hole ID	UTM Coordinates		Surface Elevation (m)	Completion Depth (m)	Thermistor Installed (Serial #)	Source
	Northing	Easting				
12259-01 (BH1)	7,504,261*	441,482*	68.6*	10.9 (below lake)	No	EBA (1996, 1997)
12259-02 (BH2)	7,504,141	441,213	71.7	4.1	No	
12259-03 (BH3)	7,504,380	441,113	77.6	16.1	Yes (#1049)	
12259-04 (BH4)	7,503,905*	442,323*	73.9	13.9	No	
12259-05 (BH5)	7,504,778	441,172	80.8	15.6	Yes (#1050)	
12259-06 (BH6)	7,505,683	441,327	69.7	15.8	Yes (#1051)	
12259-07 (BH7)	7,506,153*	441,830*	Unknown	Unknown	No	
97NOD176	7,504,962	441,481	78.3	367 @ -60° (298 true)	Yes	Golder (2000a, 2000b)
08SBD380	7,504,780	441,080	77.3	402 @ -60° (334 true)	Yes	SRK (2009e)
08SBD381A	7,504,814	441,070	69.6	401 @ -55° (298 true)	Yes	
08SBD382	7,505,141	441,026	72.8	404 @ -60° (323 true)	Yes	
10WBW004	7,505,665	441,018	Unknown	470 @ -55° (250 true)	No (Westbay)	SRK (2011b)

* Approximate information as interpolated from source drawings by SRK. Exact information is not available. Locations not marked with asterisk are surveyed coordinates.

Figures 6 through 13 summarize all available thermistor string data. It is not known if any other data from the 1996 and 1997 installations has been recorded since their installation and reporting in 1997 (EBA 1997). Golder (2000a, b) documents the findings of a site inspection, including revisiting some of the thermistors; however, no additional data was added. With assistance from the HBML surveyors, the historic thermistors were located as part of the 2009 geotechnical inspection, to determine their status. One string was severed completely (drill hole 12259-03, see Figure 5), but the remaining three appear to be intact. A readout device compatible with the military connectors on the strings was not available to test the functionality of these strings. An appropriate readout device should be obtained from EBA Engineering (the original thermistor supplier) and the string functionality should be tested during the 2012 geotechnical inspection. If the three in-tact strings are functional, the fourth string should be spliced and tested as well.

The available information confirms that the Boston Camp is located well within the region of cold, continuous permafrost. Permafrost temperatures are below about -8°C and the active layer is

generally less than 1 m thick, with the depth of zero annual amplitude about 10 m. Based on data from the deep thermistor installed in 1997, the permafrost depth is estimated to be about 520 m (Golder 2000a).

Laboratory testing (moisture contents, Atterberg Limits, grain size distribution and pore water salinity) on intact samples collected during the drilling campaign in 1996 confirms that overburden soils are comprised mainly of marine silt and morainal till ranging in thickness from 1.5 to 8 m. The silt contains up to 50% (by volume of soil) ground ice, while the till contains low to moderate ice contents (5 to 25%) (EBA 1997).

3 Inspection Conditions

Mr. Maritz Rykaart, P.Eng., Ph.D., a Principal Geotechnical Engineer with SRK, conducted the geotechnical inspection during the week of July 25-29, 2011. The detailed site inspection was carried out on foot, after conducting an aerial survey using a low altitude helicopter flyover. The site was accessed via fixed wing aircraft from the Doris North camp. No one accompanied SRK during the inspection. Mr. David Vokey and Ms. Katsky Venter, the HBML Environmental site representatives did not accompany SRK on the site inspection, but was available for questioning.

Weather conditions during the inspection were cool but sunny with light winds and no precipitation. Photos detailing the inspection conditions are included in Figures 14 through 25.

3.1 Instrumentation/ Data

3.1.1 Thermistors

A summary of the available site thermistors are discussed in Section 2.5 and all available data are presented graphically in Figures 6 through 13. With the help of HBML surveyors, the 1996 and 1997 thermistor strings were located in 2009. Three of the four strings were still intact, although they are generally in poor condition, having fallen over from their support struts. Figure 5 illustrate their current state. The fourth cable has been completely severed, most likely by an animal. The section of cable to which the readout connector is attached, is still at the site, and it should be possible to re-attach the cable through splicing.

A readout device compatible with the military connectors of these older strings was not available during the inspection. SRK understands that there is an appropriate readout device on site, but at the time of the inspection, it could not be located. These older strings were supplied by EBA, and if the on-site readout device cannot be found, a new device could be rented from EBA. It is recommended that during the 2012 geotechnical inspection that this is carried out, such that the functionality of these strings can be confirmed. Installation of thermistor strings represents a considerable investment, and therefore re-instating these strings would be valuable, although not a necessity.

Data collected from the three strings installed in 2008 (SRK 2009e), as well as the Westbay well installed in 2010 (SRK 2011) are presented in Figures 10 through 13. No new data was collected from any of these strings in 2011.

Recommendations:

1. A compatible readout device for the older thermistor strings should be obtained from EBA, the supplier (if the on-site device cannot be located), and the functionality of the three intact thermistors should be checked. If these strings are operational, the severed string should be spliced and tested as well. Any strings that are found to be functional should be included in the formal thermistor monitoring program for the site.
2. Additional attempts must be made to read the string in 08SBD381A to confirm if it remains active.
3. Formal monitoring of the on-site thermistor strings should continue. This program should consist of quarterly readings (or as close to this schedule as the camp operating window allows). This data should be reported as part of all subsequent annual geotechnical inspections.

3.1.2 Primary Tank Farm Settlement Monitoring

The 2007 annual geotechnical report recommended that a series of settlement beacons be installed on the primary tank farm containment berm to allow quarterly settlement surveys to provide early warning signs of undue tank settlement as a result of foundation settlement due to permafrost degradation. HBML opted not to install the recommended beacons, but rather initiated a survey program based on three control points on each of the eight tanks in the containment area. This is an appropriate monitoring program, in the opinion of SRK. The control points were established by the site surveyor, Mr. Jay Hallman, on April 21, 2008. The control point co-ordinates and elevations are listed in Table 4.

Table 4: Summary of Survey Control Points Established for the Primary Tank Farm

Tank	Control Point	Northing (m)*	Easting (m)*	Elevation (m)
1	A	5,325.879	1,305.901	80.674
	B	5,326.428	1,308.581	80.989
	C	5,328.263	1,306.711	80.992
2	A	5,327.678	1,315.749	80.877
	B	5,326.866	1,318.217	81.190
	C	5,329.353	1,318.048	81.114
3	A	5,331.618	1,306.850	81.057
	B	5,331.612	1,309.744	81.062
	C	5,335.467	1,307.263	81.090
4	A	5,331.166	1,318.159	81.128
	B	5,334.739	1,317.563	81.092
	C	5,334.220	1,314.710	81.128
5	A	5,337.355	1,307.654	80.896
	B	5,337.490	1,310.713	81.075
	C	5,341.035	1,307.826	81.089
6	A	5,337.092	1,317.422	80.991
	B	5,340.813	1,317.436	81.031
	C	5,340.311	1,314.183	81.061

Tank	Control Point	Northing (m)*	Easting (m)*	Elevation (m)
7	A	5,343.001	1,307.814	80.875
	B	5,343.343	1,310.862	81.005
	C	5,346.505	1,307.626	81.060
8	A	5,342.700	1,317.450	80.956
	B	5,345.860	1,317.826	80.962
	C	5,345.604	1,313.962	81.033

* This is a local grid for settlement surveying only.

Two subsequent settlement surveys were carried out in 2008 (August 7 and October 17), two in 2009 (July 25 and September 19), and one each in 2010 (August 2) and 2011 (July 3). These surveys were completed by HBML survey staff using a TOTAL Station and prisms. The survey accuracy is not stated; however, it should be within ± 10 mm. The complete results are presented in Appendix A and the overall summary data is presented in Table 5.

A review of the data suggest a slow but consistent trend of the tanks settling; however, this settlement is very small and since there is no trend of movement in the horizontal plane there is no indication that differential settlement is taking place which may cause the tanks to topple.

Table 5: Summary of Overall Settlement Data for the Primary Tank Farm (April 2008 to July 2011)

Tank	Average Survey Differences (mm)		
	Northing ¹	Easting ¹	Elevation ²
#1	3.1	0.5	-5.3
#2	2.6	-0.4	-5.8
#3	0.0	2.7	-2.1
#4	3.1	-1.1	-5.0
#5	-1.2	1.8	-5.0
#6	3.5	-1.9	-6.1
#7	-4.4	2.7	-5.8
#8	3.9	-2.4	-5.6

1. A negative value implies tank has moved to the south (Northing) or the west (Easting).

2. A negative value implies tank has moved down.

Recommendations

- Quarterly monitoring of tank settlement can be ceased and replaced with one annual reading around July or August. This data should be reviewed and reported on as part of the annual geotechnical inspection, and should there be any signs of undue movement, appropriate mitigation plans can be put in motion.
- The foundation settlement risk should be recognized in the spill response plan for the tank farm.

3.2 Containment Structures

3.2.1 Primary Tank Farm

The primary tank farm, housing eight large fuel tanks is located in an engineered secondary containment facility constructed in 2001 (Figure 14). SRK understands that there is no formal as-built documentation for the facility. Based on interviews, SRK concluded that the facility was designed by EBA and subsequently constructed by MHBL with engineering supervision by EBA.

It is understood that secondary containment is provided by a PVC liner (type unspecified) placed on a prepared rockfill pad with constructed containment berms of rockfill providing the necessary containment capacity. The liner has a top cover of gravel (crushed ore stockpile material) as a protection layer. The eight tanks are placed directly onto the protection layer and are interconnected with permanent steel piping. Fuel transfer from these main tanks into equipment, fuel drums and Tidy Tanks are done in a contained fuel transfer area, using an electric pump. The entire facility is constructed directly on permafrost overburden soils, as described in Section 2.5.

Visual inspection of the secondary containment facility showed several signs of surficial slip surfaces on the containment side slopes. In 2008, a few small tension cracks were observed along the berm crest. These were not noticed during the 2009 inspection, but were again observed as part of the 2010 and 2011 inspections. The slip surfaces could be an early indication of settlement, or may simply be relaxation due to the over steepened nature of the gravel berm. The liner is not exposed anywhere, and the containment berms for both the main containment facility and the fuel transfer areas are intact. There were no visible signs of fuel spills outside of the respective containment areas. HBML has rigorous protocols in place for fuel transfer, and provided those are followed, the facility design appears adequate to provide environmental protection.

Settlement could occur as a result of permafrost thaw due to the foundation conditions under the tank. A settlement monitoring program was put in place in April 2008 as described in Section 3.1.2. Data to date suggest that the tanks may be undergoing some settlement; however, the rate appears to be very slow and since there is no significant horizontal movement, there are no signs of differential settlement. This situation should continue to be monitored and an acknowledgement of the settlement risk should remain.

During the inspection it was noted that there was no ponded water in the containment area. The facility is equipped with a sump, and the practice of keeping the containment area free of ponded water is appropriate and should be maintained.

Two EnviroTanks® were stored immediately outside the fuel containment area at the time of the inspection; however, these were not in use and therefore require no special attention.

Recommendations:

1. The appearance of surficial slip surfaces and tension cracks on the containment berms should be monitored. Remedial measures should be implemented if there are any signs of these progressing. Should excessive deformation of these berms occur (the probability of which is likely low), the tank integrity is not at risk. It is simply the effectiveness of the secondary containment that will be compromised.
2. The tank settlement monitoring program that has been put in place is reasonable. Quarterly monitoring (or as close to this schedule as the camp operating window allows) of tank settlement

should continue. This data should be reviewed and reported on as part of the annual geotechnical inspection and, should there be any signs of undue movement, appropriate mitigation plans should be put in motion.

3.2.2 Power Plant Fuel Containment

Two small double-wall fuel tanks servicing the power plant are located in a secondary containment facility (rockfill berm) immediately west of the maintenance shop (Figure 15). Construction details for this secondary containment are not available; however, repairs to this containment system were completed in 2008, including installation of a liner (SRK 2009a). There are no concerns with this facility.

Recommendations:

1. No action required.

3.2.3 Central Pad Fuel Containment

The small double-wall fuel tank installed in 2009 located approximately in the center of the camp pad, immediately east of the geology offices was installed in a purpose built secondary containment facility using a liner (type unspecified) and the stockpiled crushed ore. The facility was founded directly on the camp pad. Construction details (design or as-built drawings) of this facility are not available. Based on visual inspection there are no apparent concerns with this facility.

The elevated double-walled fuel tanks installed in 2010, within the confines of the camp (Figure 21) did not have secondary containment; however this has been remedied as evidenced during the 2011 inspection.

Recommendations:

1. No action required.

3.2.4 Jet Fuel and Lubricant Containment

Jet fuel is stored in drums, which are grouped together on wooden pallets, stacked two high, in an area of the rockfill pad northeast of the primary fuel tank farm. Two portable pollution control berms are used to provide secondary containment as illustrated in Figure 16. There was also a stockpile of drums stored outside of these containment areas.

Both of the secondary containment facilities were compromised at the time of the inspection due to the fact that at least one wall of the containment structure was collapsed.

Recommendations:

1. The secondary containment berms should be regularly inspected and repaired as needed.
2. Confirm whether secondary containment is required for the drums that currently do not have it, and if so, install secondary containment as required.

3.2.5 Solid Waste Disposal Site (Including Burn Pit)

Combustible domestic waste is incinerated on site. Other non-hazardous and hazardous waste is stockpiled, packaged and seasonally removed from site to Yellowknife or Hay River as backhaul

opportunities arise. HBML has substantially cleaned up the site and the backlog of material that still has to be hauled away has been significantly reduced since the 2008 annual geotechnical inspection was completed. The waste material that remain on site is not stored within designated containment facilities; however, the waste is neatly organized and due to the nature of the waste (as described by site staff), environmental containment does not appear to be necessary. This should be confirmed through an appropriate inventory.

At one time, all wood waste was burned in a burn pit (a converted sedimentation pond) located immediately south of the active sedimentation pond (Figure 17); however, this practice has been discontinued and all non-combustible materials was removed from the pit. Up to 2010, the burn pit itself was used to contain unburned wood waste and ash, but it has been completely cleaned in 2011.

Recommendations:

1. Confirm through an appropriate waste inventory that there are no wastes that require environmental containment. *This may have already been conducted; however, SRK is not aware of the study.*

3.2.6 Ore Stockpiles

A large number of crushed ore stockpiles are located on the northwestern portion of the camp complex foundation pad (Figure 18). This ore comes from the 27,000 ton bulk sampling program carried out between 1996 and 1997. These stockpiles are individual un-compacted end-dump piles. Surface water drainage from this part of the foundation pile is not specifically separated from the rest of the foundation fill pad, and is not contained, but allowed to flow directly onto the tundra.

The 2007 inspection report recommended that HBML compile a detailed database of all the seep sampling tests carried out over the life of the facility and have that data reviewed by an appropriately qualified professional with the specific objective of determining whether there is any poor quality seepage emanating from the exposed ore stockpiles. HBML contracted a specialist geochemical study with SRK to complete an inspection and sampling program to assess the geochemical performance of historic waste rock and ore at Boston. The objectives of this work were twofold: (1) to fulfill the conditions of Water License No. 2BB-BOS0112 Part E, Item 8 and, (2) to assess the geochemical performance of the weathered materials as a part of the geochemical characterization currently in progress to support future permitting activities.

The program included sampling of waste rock and ore from the ore stockpiles, roads and airstrip, as well as a seep survey around the perimeter of the site. This work was done in July 2008. Testing of the waste rock included field contact tests, acid-base accounting, metal analyses and leach extraction tests. There is also historical seepage available for this area that was analyzed as part of this program. The results of this study were presented in a technical report (SRK 2009b) which was submitted to the Nunavut Water Board in 2009.

SRK also completed a water and ore/ waste rock management plan ("Plan") for the Boston site, based on the results of the geochemical assessment completed (SRK 2009d). This Plan was also submitted to the Nunavut Water Board in 2009 and stipulates appropriate management protocols for this material.

Recommendations:

1. The procedures, protocols and monitoring plan stipulated in the 2009 water and ore/ waste rock management plan for the Boston site should be implemented.

3.2.7 Settling Pond

One lined settling pond (Figure 17) has been constructed along the eastern perimeter of the camp foundation pad (immediately north of the burn pit). As-built records for the construction of this pond are not available. It is understood that this pond was used to contain wash water during the screening and crushing of ore as part of the bulk sampling program.

The pond was in poor shape in 2007; however, substantial repairs were carried out on the liner in 2008 (SRK 2009a). The condition of the pond during the 2010 inspection showed signs of deterioration, most notably due to the liner no longer being supported at the crest through sand bags, probably as a result of strong winds. This situation has worsened based on the 2011 inspection. In previous years the pond was shown to contain various amounts of gravel (crushed ore) and wood debris which could compromise the liner integrity; however, at the time of the 2011 inspection it contained a significant amount of water so it is not known if the gravel and other debris has been removed.

Currently the pond is used as an emergency holding pond for possible fuel spills, disposal of water from fuel containment berms, or when the sewage treatment plant experiences upset conditions. SRK is of the opinion that, if this pond is to be used for anything where there would be solids collected in the pond, its design would make it extremely difficult to remove these solids to retain pond capacity due to its depth and the fact that the liner is not protected. Furthermore, since the pond does not have a designed overflow facility (i.e. spillway), it would experience uncontrolled overflow when its capacity is exceeded. HBML has stipulated that an overflow is not required as the management practice is to pump out snowmelt and rainwater as required, after testing for contaminants.

The pond has no instrumentation of any nature and, as such nothing can be said about its historic performance. A reconnaissance survey of the pond did identify a clear zone of water seeping from the downstream toe of the pond embankment. Although it cannot be definitively confirmed that this seepage is emanating from the pond, there are no other likely sources. Since the pond was about half full during the 2011 inspection it provided an opportunity to check for leaks but none immediately apparent.

Recommendations:

1. Repairs to the liner in the pond must be carried out. This includes inspecting and repairing any tears as well as re-anchoring the liner to the crest. At the same time a permanent emergency spillway must be constructed.
2. Water quality sampling should be undertaken to confirm whether the wet zone downstream of the pond is in fact seepage emanating from the pond. If the flow is confirmed as seepage, an appropriate mitigation plan must be implemented to have the liner repaired.
3. The debris in the pond should be cleared out as it poses a potential puncture risk to the liner.
4. A management plan must be implemented to ensure sediment (i.e. hydrocarbon contaminated soil, sewage treatment plant sludge, etc.) can be removed without damaging the liner.

5. If the pond is to be used to retain water for any length of time, a suitable leak detection monitoring system should be implemented. As a minimum, a protocol involving frequent visual inspections would have to be put in place for the pond. Excessive and prolonged leaking will lead to permafrost degradation, which in turn will result in differential settlement that may cause the liner in the pond to fail.
6. The pond should have a suitable barricade around it to prevent human and animal access. Due to the current design, it would be extremely difficult to get out of the pond unassisted if a human or animal were to inadvertently enter or fall in.

3.2.8 Soil Containment Berm (Landfarm)

As a result of a historic fuel spill, HBML constructed a lined soil containment facility (Figure 19) within which all excavated contaminated soils have been stored (EBA 2004). SRK reviewed the as-built records for this facility (EBA 2004) and, supported by visual inspection, confirms that it consists of a bermed and lined area in which contaminated soil is placed. In addition to soils spread about 1 m thick over the entire surface of the facility, there are also a large number of old fuel drums filled with contaminated soils contained within the confines of the facility.

From discussions with HBML site staff in 2007 and a review of the as-built report, it appears that the soil containment berm was designed to be used as an active hydrocarbon landfarm area. A land farming protocol was not provided in the as-built report; however, site staff confirmed that since initial placement of the contaminated soils into the containment area, there has been no work carried out in the form of tilling or any other means of soil mixing. HBML did routinely conduct soil sampling within the confines of this facility, the results of which are reported as part of the annual Licence conditions. Based on a review of the formal operational procedure of HBML land farming practices (MHBL 2007), and comparison of that with the site staff, SRK doubts whether the soil sampling results reported by HBML would be representative. The primary reason for coming to this conclusion is that the soil in the facility is about 1 m thick, and has never been tilled or reworked in any way, as confirmed by HBML staff. Furthermore, the soil sampling to date only effectively covers the upper 10 cm of the profile.

HBML did commission a study in 2009 to test the soils contained in the landfarm in accordance with appropriate protocols, and are in the process of developing an appropriate remediation strategy for these materials. The current plans is that these hydrocarbon contaminated materials will be backhauled for off-site disposal.

The containment facility itself however appears to be intact; although it is filled to capacity and would not be able to contain more soil until some of it has been adequately treated and/or relocated.

Recommendations:

1. The site appears to be fully contained and therefore does not pose any immediate risk.

3.2.9 Diamond Drill Cuttings and Settling Pond

Some drill cuttings have historically been disposed of permanently in a settling pond immediately west of the airstrip (Figure 22). Site staff could not confirm if this pond was intentionally designed, but if so there are no as-built records and the timeframe for how long this practice has been in operation is not clear. Visual inspection suggests that the pond is located at a historic drill hole. Poor control of the drill fluid resulted in permafrost degradation and subsequent annual thaw created

by a pool of standing water resulted in the pool increasing in size. At some stage, the pond started to overflow and silt-laden water started to flow overland towards open water bodies. At that time, drill cuttings were placed in the pond in an attempt to stop further degradation. Geotextile was also installed to control silt flowing from the pond.

Although there were signs of this pond being actively used in 2007, there was no evidence of it being used since 2008. Considering the amount of standing water present during the inspection, as well as the apparent previous random placement of drill cuttings, SRK is not convinced that the permafrost degradation has stopped, and although there was no visual evidence of silt laden water flowing from the pond, there remains a significant section of the pond downstream of the geotextile silt barrier.

Recommendations:

1. SRK is not convinced that the settling pond is appropriate for its current use. Should there be a need for a settling pond, it is recommended that it be re-engineered to control the permafrost degradation, and to ensure that silt traps are located in the optimal positions.
2. Considering the fact that HBML will continue to collect significant amounts of drill cuttings, an appropriate management plan for these cuttings will have to be developed. This may include specific placement procedures for drill cuttings into permafrost degradation areas. An operational plan should be developed for this, possibly with the assistance of an appropriately qualified Professional Engineer with permafrost experience.

3.3 Mine Openings

3.3.1 Portal

A bulk sampling program was completed by BHP in 1996 and 1997, at which time 27,000 tonnes of ore and 106,000 tonnes of waste rock were extracted. The ore was crushed on site, and stockpiled on a rockfill pad constructed from the waste rock. The waste rock was also used for other infrastructure such as the airstrip. The bulk sampling extraction was via 2,300 m of underground development (completed by Procon Mining and Tunnelling Ltd.) using a ramp that extends from ground surface at approximately 4,035 m elevation to approximately 3,850 m elevation (local mine grid). The 185 m deep ramp dimensions are approximately 5 m wide by 3.6 m high. The orientation of the ramp is generally north-south. Five cross-cuts were established, three into the B2 Zone and the remaining two into the B3 Zone.

The portal, which is located about 25 m east of the maintenance shop as illustrated in Figure 20, was collared in altered volcanic rock, all within the permafrost. This was confirmed through installation of four underground thermistors (Golder 2000a, b). During extraction of the bulk sample, the portal was not heated but operated at an ambient temperature of about -10°C. The portal was operated under dry conditions with no groundwater inflow. After completion of the bulk sample collection, the portal was abandoned and sealed off with a locked gate.

The decline was reported to be dry and geotechnically sound during a site inspection by Golder Associates Ltd. in April 2000 (Golder 2000b). According to site personnel the last operational entrance of the portal was in 2001. An attempt to enter in 2004 was aborted, reportedly due to the presence of a frost p

lug, likely created due to pooled water (from rainfall and snowmelt) at the portal entrance. There are also unconfirmed reports that water has run down the ramp some distance and formed an ice dam.

During the 2010 site inspection, the bulk of the portal access was flooded. It would appear as if the condition of the portal remain unchanged from the last inspection in 2009 where it was found that the portal seal to prevent unauthorized access was intact, and the signpost that identifies the area as potentially hazardous and warning persons against entering the area without permission was badly weathered and barely legible.

The visible exposed portion of the portal roof shows signs of minor rock spalling; however, the roof appears to be essentially structurally intact. There continues to be evidence of small fragments (less than 10 cm diameter) having broken off. The roof is armoured with 10 cm wide steel banding and rock bolts at this time. The most likely cause of spalling is freeze-thaw action.

Recommendations:

1. SRK recommends that HBML replace the weathered warning notices at the portal entrance advising of the dangers associated with unauthorized access to the area.
2. The rock spalling on the exposed section of the portal roof is likely a fall hazard. Persons entering the area should wear appropriate personal protective equipment; however, a site specific hazard assessment should be completed to make people aware of the dangers. Should there be a need for any individual to enter the area for reasons other than a brief inspection, consideration should be given to installing roof support, such as a small diameter wire mesh (50 mm mesh) to mitigate the fall hazard.

3.3.2 Vent Raise

There is a single vent raise located about 100 m south-west of the portal entrance (Figure 23). Mechanical and electrical support equipment is installed on a levelled wooden platform about 0.6 m off the tundra. The vent area and wooden platform base are sealed off with tarps and the mechanical and electrical equipment is locked in a steel shed. Overall the facility looks weathered; but there does not appear to be permafrost degradation. Site staff could not confirm when the facility was last accessed or inspected in detail.

Recommendations

1. The tarps are significantly weathered and their attachment points are starting to come apart. The tarps should be replaced.
2. Sign posts warning visitors of potential dangers associated with accessing the area do not exist. It is recommended that signs be erected.

3.4 Infrastructure

3.4.1 Road to Dock

The single lane road to the dock consists of 0.3 to 0.6 m thick rockfill placed directly onto the tundra. Since the road runs down-gradient towards Stickleback Lake, small contour berms have been constructed, redirecting surface runoff from the roadway. Minor signs of surface water erosion are evident along the road, but this damage would be considered quite normal for a road of this nature. Likewise, minor undulations (deformation) in the road suggest there may be isolated small pockets

where permafrost degradation has occurred, and the active layer has consolidated. There is no thermal instrumentation or geologic data to support this observation. Considering the amount of time the road has been in operation, this deformation is likely historic; however, the undulating road could be a safety concern. Appropriate speed control should be implemented for the road.

Site staff confirmed that repairs are conducted to the road surface if and when there are any signs of surface erosion or other significant undulations. Based on descriptions from site staff, the predominant material used for maintenance purposes is crushed ore. This amount of maintenance has never been substantial.

Recommendations:

1. Maintain the current level of care and maintenance on this road; but stop the use of crushed ore to avoid water quality problems linked to the geochemistry of the ore. A suitable alternative clean source of rock should be located.
2. Ensure that appropriate speed control is exercised on this road.

3.4.2 Camp Complex Foundation Pad

The foundation pad of crushed rock (Figure 21), which underlies most of the site infrastructure, varies in thickness from 0.6 to 3 m according to previous records. Initially the pad was constructed to ensure north-south drainage with the pad sloping about 1% towards the north. The foundation pad was designed to prevent thaw settlement and permafrost degradation within the operating footprint of the advanced exploration camp.

There is no instrumentation installed in the pad to confirm the thermal regime beneath the pad. Visual inspection suggests that localized settlement has occurred, as there are local low spots and evidence of significant ponding on the pad. There is no longer a constant drainage grade off the pad.

Differential settlement of the pad appears to be within areas where the pad is the thinnest, although there are no as-built records to corroborate this observation. The accommodation complex does not appear to be impacted structurally by differential settlement, probably since these structures can be levelled by simply adding more blocking as required. It is not known how much levelling of the camp has occurred over the years. The only significant consequence of differential settlement is localized ponding of water. This ponding is likely an inconvenience in day-to-day camp life, but more importantly, it acts as a new heat source and further increases the active layer depth leading to more settlement.

There is one large erosion gully south of the camp complex (Figure 21). This gully has been repaired by infilling with fine crush material, from the ore stockpiles. Whilst this appears to have been successful in preventing further erosion and permafrost degradation, this material may contribute towards poor quality leachate. This should be evaluated as part of the newly developed water and ore/ waste rock management plans. Other than this gully, there are no visual signs of concentrated flows from this pad, and there is no evidence of any erosion gullies along the edge of the pad.

There was a fuel spill at one time immediately south of the camp. The hydrocarbon contaminated soils were excavated and placed in the landfarm. Currently this area is poorly drained and at the

time of inspection, there was standing water which appeared to contain algae. This ponded water will result in permafrost degradation, and should be pumped out on a seasonal basis.

Recommendations:

1. HBML should have the pad surveyed and develop an action plan to fill in and re-grade the pad to re-establish constant drainage from the pad. Special attention must be given to preventing further ponding on the pad as it may promote permafrost degradation.

3.4.3 Road to Airstrip

The single lane roadway to the airstrip is constructed from crushed rock ranging in thickness from 0.3 to 0.6 m. There are local depressions along the road that are more pronounced than the immediately adjacent topography, suggesting that some permafrost degradation has occurred resulting in settlement. Site staff confirmed that on a few occasions minor infilling of low spots has been carried out; however, there does not appear to be a formal record of any such remediation works.

Visual inspection did not identify any signs of surface water erosion, and although there are no culverts through the road, there are no signs that the road is resulting in surface water ponding.

Recommendations:

1. Maintain the current level of care and maintenance on this road, but stop the use of crushed ore. A suitable alternative clean source of rock should be located.
2. Ensure that appropriate speed control is exercised on this road.

3.4.4 Airstrip

The airstrip (Figure 22) was constructed in the summer of 1997 by Procon Mining & Tunnelling Ltd. under contract to BHP. Boston development waste rock was used to construct the airstrip (BHP 1997).

The north-south all-weather airstrip is a rockfill structure similar to the roads and foundation pad. It appears to be generally thicker than the road, and although there is no as-built information available, visual inspection suggests that its thickness ranges between 0.6 and 1.2 m.

Significant settlement along the airstrip alignment reportedly occurs every year, and as a result frequent infilling and levelling has had to be carried out on the airstrip over the years to ensure safe aircraft operation. According to HBML staff the airstrip is inspected annually by the aircraft charter company for operational suitability and, if requested, HBML carries out maintenance as needed. The latest levelling and maintenance was carried out in August 2007 by Nuna Logistics, under the direction of SNC-Lavalin Engineers and Contractors (SLEC). Material from the crushed ore stockpiles was used as infill material for the repairs, and site staff confirmed that this material was used for repairs in previous years as well.

Although there is no thermal monitoring instrumentation under the airstrip, the settlement is most likely as a result of thaw settlement in the underlying permafrost.

There are no signs of surface erosion on the airstrip. The airstrip does not have any culverts to allow water flow; however, visual inspection did not identify any pre-construction flow paths that may have been obstructed by the airstrip. There is a significant number of standing water ponds immediately

adjacent to the airstrip. These ponds are permafrost degradation zones resulting from drillholes. More details about these ponds are discussed later in the report; however, the presence of these ponds threatens the integrity of the airstrip, and will lead to elevated maintenance costs.

There are small tension cracks along the crest of the airstrip shoulder, generally in areas where large ponds are situated. While these cracks do not suggest any immediate risk, they should be monitored frequently for signs of progression.

Recommendations:

1. The ponding immediately adjacent the airstrip, resulting from permafrost degradation at historic drill sites, should be prevented. Further details about this issue are discussed elsewhere in this report.
2. Conduct frequent walk-over surveys of the airstrip crest to ensure there are no progressive worsening of the tension cracks along the shoulder crests.

3.4.5 Drill Road

This road leads off from the north end of the airstrip to an old drill staging area (Figure 22). It has the same design as the other site roads. There are no additional issues or concerns relating to this road other than those raised previously for other roads.

Recommendations:

1. Maintain the current level of care and maintenance on this road, but stop the use of crushed ore. A suitable alternative and clean source of rock must be located.
2. Ensure that appropriate speed control is exercised on this road.

3.4.6 Core Storage Road

The core storage road (Figure 22) leads off midway from the airstrip towards a rock outcrop area where core boxes are stored. This road, which receives relatively little traffic, is of similar design to the other site roads. There is a 200 mm steel pipe culvert at the west end of the road, apparently allowing water from the large permafrost degradation zone pond to the north to drain towards the south. The pipe culvert appears to have settled to a point where its invert level is below that of the areas to be drained. Subsequently the culvert no longer functions and ponding at either end of the pipe is contributing to additional permafrost degradation.

Recommendations:

1. Consideration should be given to removing the culvert and implementing appropriate remedial measures to the areas of permafrost degradation. This should not be done without developing a comprehensive permafrost degradation mitigation plan for the site, as there are many ponded areas that may have to be interconnected to resolve the problem in the long term (see also Section 3.5.3).
2. Ensure that appropriate speed control is exercised on this road.

3.4.7 Wooden Walkway to Boat Dock

The wooden walkway leading from the southern end of the airstrip to a boat dock in Stickleback Lake (Figure 22) has been constructed as a floating walkway directly on the tundra. The walkway has

settled into the tundra hummocks and although there is no lasting permafrost damage at this time, vegetation dieback may ultimately result in the start of an erosion gully, which in turn would lead to erosion permafrost degradation.

At the time of the inspection the boat dock was in disrepair and had been decommissioned. The dock and walkway should be completely removed if there are no future plans to re-commission the dock.

Recommendations:

1. Completely remove the dock and walkway if there are no plans to re-commission the dock.

3.4.8 Radio Tower and Shack

A new radio repeater tower was installed south-east of the vent raise in 2009 (Figure 23). The tower was designed and installed by SLEC. The tower is supported by a concrete foundation embedded in bedrock and three wire anchors embedded in bedrock. The radio tower equipment is installed in an un-insulated wooden shack immediately adjacent to the tower. The shack is on a timber foundation of levelling blocks directly on an outcrop area.

Recommendations:

1. No action required.

3.4.9 Water Intake Pump Shack

Potable water for the Boston Camp is supplied from Spyder Lake. A wooden pump shack houses the primary pump elements (Figure 21). This wooden shack is located immediately outside the ordinary high water mark on Spyder Lake, and is placed directly onto the tundra. There are no signs of permafrost damage at this time; however, vegetation dieback likely has occurred immediately beneath the shack.

Recommendations:

1. It is not good practice to construct infrastructure directly onto the permafrost. HBML should consider constructing a thermal pad or other appropriate foundation to ensure preservation of the permafrost.

3.4.10 Existing STP Foundation Pad

The existing STP is constructed on a small levelling pad of crushed ore, some distance west of the camp pad (Figure 25). The pad is generally very thin, (less than 0.5 m thick) and therefore not sufficiently thick to act as a true thermal pad. There are however no signs of permafrost damage at this time.

Recommendations:

1. No action required.

3.4.11 New STP Foundation Pad

The new STP has been constructed northwest of the camp, and north of the existing STP (Figure 25). Originally this STP was to be constructed on a levelled thermal pad constructed from crushed

ore; however, in accordance with the newly adopted water and ore/ waste rock management plan for the site (SRK 2009d), HBML changed the design. The pads were however already constructed before the decision to change was made and therefore the ore had to be backhauled. One of the two constructed pads was however not removed. Where the pad was removed some minor damage to the tundra vegetation occurred, which could result in ongoing permafrost degradation if not monitored and repaired if and when it becomes evident.

The new STP foundation consists of levelling timbers and platforms to allow circulation of cold air, which in turn will ensure integrity of the permafrost.

Recommendations:

1. The area where the ore pad was backhauled, and where minor damage to the tundra occurred, must be monitored to ensure no ponding of water, which would lead to increased vegetation dieback and subsequent permafrost damage.

3.5 Other Areas

3.5.1 Core Storage Area(s)

Core boxes are being stored at the following locations, as illustrated in Figure 24:

- East of the airstrip, scattered around sections of exposed bedrock and occasionally directly on the tundra; however, due to the location, the permafrost overburden at these locations is likely shallow. Visual inspection yielded no concerns with respect to permafrost degradation.
- At the end of the drill road northwest of the runway. Boxes are partly stored on a pad, but mostly directly on the tundra. This area has extensive permafrost and vegetation dieback damage, but this is not from storage of the core boxes (see Section 3.5.4).
- On the camp pad at various locations. There are no concerns about any of these areas.
- At two locations immediately east of Stickleback Lake. At both these sites the boxes are stored directly on the tundra. Visual inspection yielded no concerns with respect to permafrost degradation, but vegetation dieback has occurred immediately beneath the boxes.

SRK understands that HBML is reviewing their site wide core storage protocols. It is recommended that wherever possible core storage should be on rock outcrops or dedicated gravel pads. Where there are no reasonable alternative, but to store core on the tundra, the boxes should be placed on timbers, and the area must not be low-lying or poorly drained. Storage of core boxes directly on the tundra does not automatically lead to permafrost degradation; however the underlying vegetation dies, and that could lead to permafrost and erosional damage if the vegetation cannot be re-established.

Recommendations:

1. HBML should re-evaluate their core storage requirements, as the random aerial spread of core boxes at these locations may not be suitable in the long term.
2. Consideration should also be given to relocating any core storage boxes that are not currently on exposed bedrock. This should be done as part of a long-term core storage plan.
3. HBML should consult the services of an expert knowledgeable with tundra vegetation to implement appropriate remediation strategies.

3.5.2 Grey Water Discharge

Grey water from the sewage treatment plant is currently being discharged at a location immediately north of the camp foundation fill pad (Figure 25). This water ultimately flows overland towards the east arm of Stickleback Lake. During the 2007 inspection it was noted that a large clearing devoid of any vegetation has developed where the water is discharged, and although there was no standing water at the time of the inspection, it is evident that at times significant ponding did exist. A well-developed overland channel has also formed where the ponds overflow onto the tundra, and since the vegetation in this area no longer exists, there are signs of overland erosion.

The 2008 inspection revealed that HBML had constructed a permanent drop box for the grey water discharge. Water overflowed from this box onto an area covered with cocoa fibre matting that has been placed in the area where vegetation dieback was observed in 2007. This practice continued since this is an improved strategy, although, a long-term management plan is still required to prevent permanent vegetation dieback and permafrost degradation.

HBML developed new management plans for disposal of grey water in 2009 (SRK 2009c), and are to be implemented in due course.

Recommendations:

1. SRK understands that HBML has developed a new sewage management plan (SRK 2009c), which is intended to be implemented imminently. Grey water discharge should be in accordance with this new plan.
2. The erosion protection measures currently in effect is an improvement over what was in place in 2007; however, a long-term plan is required as prolonged application of grey water in the same area will not be managed through erosion protection measures alone.
3. HBML should consult the services of an expert knowledgeable with tundra vegetation to implement appropriate remediation strategies.

3.5.3 Drill Sites

The bulk of exploration drilling is carried out with diamond core drills, using mud and brine as drilling fluid. Much of this drilling fluid is recycled; however, there are instances where a significant amount of this fluid ends up being discharged at the drill site (or at least this has historically been the case). Along the north and eastern perimeter of the foundation fill pad, there are a number of locations where drill fluid was allowed to discharge directly onto the tundra. At these locations vegetation dieback has occurred, which in time has resulted in minor erosion damage. Examples of this design are illustrated in Figure 22.

A number of historic drill sites are visible from the airstrip (some of which are immediately adjacent to the airstrip). In these areas the brine resulted in vegetation dieback and, because natural drainage in the area is poor, the ponded water remained in place. This ponding causes permafrost degradation, which causes a larger pond and this process of increased degradation continues to get progressively worse over time.

HBML will, whenever practical during the early spring, pump out any standing ponds. This practice must however cease once the bird nesting season begins.

Recommendations:

1. HBML has initiated remediation measures to address some of the erosion gulleys formed by drill fluid using cocoa matting and re-vegetation. This program appears to be successful at controlling erosion and although vegetation re-growth appears slow, it is likely to occur. HBML should consult the services of an expert knowledgeable with tundra vegetation to implement appropriate remediation strategies.
2. An action plan is needed to remediate the drill sites where significant permafrost degradation has resulted in permanent ponds of standing water. These ponds are resulting in increased permafrost degradation, which in turn results in increased ponds.

3.5.4 Vegetation Dieback Zones

In addition to the localized areas of vegetation dieback described in Section 3.5.2 and 3.5.3, there are two large areas of vegetation dieback on the property, the origin of which is not clear. The first is an area south of the core storage road and east of the airstrip. In this area the vegetation has died but the underlying soils have not yet been exposed. The second area is between the drill road and the airstrip. Figure 22 provides examples of this damage. At this location the vegetation has died and the overburden soils have been exposed. The area is wet and difficult to traffic.

Recommendations:

1. HBML should initiate a study to determine why vegetation dieback has occurred in these areas.
2. An appropriate mitigation plan should be implemented to address these areas. If left unattended to, permafrost degradation will continue to get worse.
3. HBML should consult the services of an expert knowledgeable with tundra vegetation to implement appropriate remediation strategies.

3.5.5 V-Notch Weir

A V-notch weir was installed at the outlet from Stickleback Lake in the early 1990's as part of baseline data gathering studies (Figure 24). The installation was done with the least amount of invasive techniques, by wedging in the measurement weir using tote bags filled with drill cuttings. In accordance with the Water Licence, this weir should be removed. A detailed inspection of the conditions at this weir was not completed during the 2011 inspection; however, the flyover inspection confirmed that although it has been breached remnant of it was still in place.

Recommendations:

1. Complete a thorough inspection of the conditions at the V-notch weir during the 2012 annual geotechnical inspection.
2. Develop an appropriate remediation plan for removal of the V-notch weir.

3.5.6 Salt-burn Area

An incident at an exploration drill located due east of the airstrip in 2011 resulted in release of a significant amount of drilling fluid (brine) which subsequently resulted in a substantial salt-burn killing the tundra vegetation (Figure 22). In addition, immediately beneath the drill permafrost degradation occurred leaving an exposed hole with no drainage. Perpetual ponding will exacerbate permafrost degradation at this location.

Following the spill HBML installed cocoa matting over the damaged tundra and has consulted with appropriate experts to develop a suitable remediation plan for this area.

Recommendations:

1. Continue developing and subsequently implement an appropriate remediation plan for remediation of this site.

4 Summary of Recommendations

This report provides a performance assessment of the numerous foundation pads and infrastructure at the Boston Advanced Exploration Camp. The findings are based on a site visit and walkover survey on between July 25 - 29, 2011 and subsequent consultation with site staff and contractors. This is the fifth formal annual geotechnical inspection undertaken at the site, and shows many improvements over the findings observed in previous years. HBML has initiated a number of projects which have been completed, or are currently underway, which specifically targets many of the remaining issues identified during this geotechnical inspection.

Overall there are no immediate or significant areas of concern at the Boston Camp from a geotechnical point of view. There are also no issues that require urgent and immediate action, but there are elements that should be monitored. Table 6 below provides a summary of recommendations resulting from the geotechnical inspection completed in 2011, complete with observations listed in the 2010 annual geotechnical report (SRK 2011a).

Table 6: Summary of Inspection Items and Associated Recommendations

Inspection Item	2010 Recommendations	2011 Recommendations
Thermistors	<ul style="list-style-type: none"> Locate appropriate readout device for older thermistors and confirm functionality of strings Splice broken string Confirm status of string in 08SBD381A Continue formal monitoring of new (and older) strings 	<ul style="list-style-type: none"> Locate appropriate readout device for older thermistors and confirm functionality of strings Consider splicing broken string Confirm status of string in 08SBD381A Continue formal monitoring of new (and older) strings
Primary Tank Farm Settlement Monitoring	<ul style="list-style-type: none"> Continue quarterly monitoring Recognize foundation settlement risk in spill response plan 	<ul style="list-style-type: none"> Cease quarterly monitoring, but once per year in July or August Recognize foundation settlement risk in spill response plan
Primary Tank Farm	<ul style="list-style-type: none"> Monitor the surficial slip surfaces on the tank farm berms Continue settlement monitoring as described above 	<ul style="list-style-type: none"> Monitor the surficial slip surfaces on the tank farm berms Continue settlement monitoring as described above
Power Plant Fuel Containment	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
Central Pad Fuel Containment	<ul style="list-style-type: none"> No action required Confirm whether secondary containment is required for two new tanks and implement if necessary 	<ul style="list-style-type: none"> No action required

Inspection Item	2010 Recommendations	2011 Recommendations
Jet Fuel Containment	<ul style="list-style-type: none"> Conduct regular inspections of the portable containment berms 	<ul style="list-style-type: none"> Conduct regular inspections of the portable containment berms Confirm whether secondary containment is required for additional drums and implement if necessary
Solid Waste Disposal Site (including burn pit)	<ul style="list-style-type: none"> Confirm that waste containment is not required through an appropriate waste inventory Clean out burn pit and dispose wood waste as appropriate Remediate burn pit, or reclassify for other functional use 	<ul style="list-style-type: none"> Confirm that waste containment is not required through an appropriate waste inventory
Ore Stockpiles	<ul style="list-style-type: none"> Implement the 2009 water and ore/waste rock management plan developed for the site 	<ul style="list-style-type: none"> Implement the 2009 water and ore/waste rock management plan developed for the site
Settling Pond	<ul style="list-style-type: none"> Clear out debris in pond that could damage liner Implement the 2009 water and ore/waste rock management plan developed for the site Construct suitable barrier around the pond to prevent inadvertent human and/or animal access <p>Confirm through water quality sampling whether the pond is leaking, and implement mitigation measures as appropriate</p>	<ul style="list-style-type: none"> Clear out debris in pond that could damage liner Implement the 2009 water and ore/waste rock management plan developed for the site Construct suitable barrier around the pond to prevent inadvertent human and/or animal access Confirm through water quality sampling whether the pond is leaking, and implement mitigation measures as appropriate <p>Repair liner</p>
Soil Containment Berm (Landfarm)	<ul style="list-style-type: none"> Implement action items arising from landfarm study recently completed 	<ul style="list-style-type: none"> Relocate hydrocarbon contaminated materials and remediate site
Diamond Drill Cuttings and Settling Pond	<ul style="list-style-type: none"> Develop appropriate remediation plan for the pond Develop appropriate management plan for storage of drill cuttings, including possible use as remediation method for permafrost degradation zones 	<ul style="list-style-type: none"> Develop appropriate remediation plan for the pond Develop appropriate management plan for storage of drill cuttings, including possible use as remediation method for permafrost degradation zones

Inspection Item	2010 Recommendations	2011 Recommendations
Portal	<ul style="list-style-type: none"> Replace the faded notices at the portal entrance advising of the dangers associated with unauthorized access to the area Develop site specific hazard assessment for people entering the portal area to address the rockfall hazard Consider installing a small diameter wire mesh over the exposed section of the portal roof to address the rockfall hazard 	<ul style="list-style-type: none"> Replace the faded notices at the portal entrance advising of the dangers associated with unauthorized access to the area Develop site specific hazard assessment for people entering the portal area to address the rockfall hazard Consider installing a small diameter wire mesh over the exposed section of the portal roof to address the rockfall hazard
Vent Raise	<ul style="list-style-type: none"> Replace weathered protective tarps covering the shelter erected over the vent raise Install notices at the vent raise advising of the dangers associated with unauthorized access to the area 	<ul style="list-style-type: none"> Replace weathered protective tarps covering the shelter erected over the vent raise Install notices at the vent raise advising of the dangers associated with unauthorized access to the area
Road to Dock	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures
Camp Complex Foundation Pad	<ul style="list-style-type: none"> Re-survey the pad and develop an action plan to fill in and re-grade the pad to re-establish constant pad drainage 	<ul style="list-style-type: none"> Re-survey the pad and develop an action plan to fill in and re-grade the pad to re-establish constant pad drainage
Road to Airstrip	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures
Airstrip	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Conduct frequent walk-over surveys to inspect for tension cracks along the airstrip shoulder 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Conduct frequent walk-over surveys to inspect for tension cracks along the airstrip shoulder
Drill Road	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Implement speed control measures

Inspection Item	2010 Recommendations	2011 Recommendations
Core Storage Road	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Monitor the pipe culvert for progressive permafrost degradation Implement speed control measures 	<ul style="list-style-type: none"> Maintain current maintenance practices, but do not use crushed ore material for repairs; find an alternate clean source Monitor the pipe culvert for progressive permafrost degradation Implement speed control measures
Wooden Walkway to Boat Dock	<ul style="list-style-type: none"> Consider raising the walkway above the tundra to prevent vegetation dieback and possible onset of permafrost degradation If boat dock is to be decommissioned consider removing the walkway altogether 	<ul style="list-style-type: none"> Completely remove the dock and walkway if there are no plans to re-commission the dock
Radio Tower and Shack	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
Water Intake Pump Shack	<ul style="list-style-type: none"> Consider installing thermal pad or other appropriate foundation system 	<ul style="list-style-type: none"> Consider installing thermal pad or other appropriate foundation system
Existing STP Foundation Pad	<ul style="list-style-type: none"> No action required 	<ul style="list-style-type: none"> No action required
New STP Foundation Pad	<ul style="list-style-type: none"> Monitor the areas where tundra vegetation damage has occurred Develop long-term re-vegetation plan; involve a tundra vegetation expert 	<ul style="list-style-type: none"> Monitor the areas where tundra vegetation damage has occurred Develop long-term re-vegetation plan; involve a tundra vegetation expert
Core Storage Area(s)	<ul style="list-style-type: none"> Consolidate core box storage and ensure that no boxes are inadvertently stored on the tundra Develop a long-term core storage plan 	<ul style="list-style-type: none"> Consolidate core box storage and ensure that no boxes are inadvertently stored on the tundra Develop a long-term core storage plan
Grey Water Discharge	<ul style="list-style-type: none"> Implement the new sewage management plan developed for the site when the new STP is commissioned 	<ul style="list-style-type: none"> Implement the new sewage management plan developed for the site
Drill Sites	<ul style="list-style-type: none"> Develop remediation strategy to prevent further permafrost degradation 	<ul style="list-style-type: none"> Develop remediation strategy to prevent further permafrost degradation
Vegetation Dieback Zone	<ul style="list-style-type: none"> Initiate study to determine why dieback continues; involve a tundra vegetation expert Develop remediation strategy to prevent further dieback and permafrost degradation 	<ul style="list-style-type: none"> Initiate study to determine why dieback continues; involve a tundra vegetation expert Develop remediation strategy to prevent further dieback and permafrost degradation

Inspection Item	2010 Recommendations	2011 Recommendations
V-Notch Weir	<ul style="list-style-type: none">• Conduct complete inspection of the weir during 2011 geotechnical inspection• Develop appropriate remediation plan for the weir	<ul style="list-style-type: none">• Conduct complete inspection of the weir during 2012 geotechnical inspection• Develop appropriate remediation plan for the weir
Salt-burn Area	<ul style="list-style-type: none">• Not applicable	<ul style="list-style-type: none">• Continue developing and subsequently implement an appropriate remediation plan for remediation of this site

This report, "2011 Annual Geotechnical Inspection, Boston Advanced Exploration Project, Hope Bay, Nunavut" has been prepared by SRK Consulting (Canada) Inc.

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Practice Leader

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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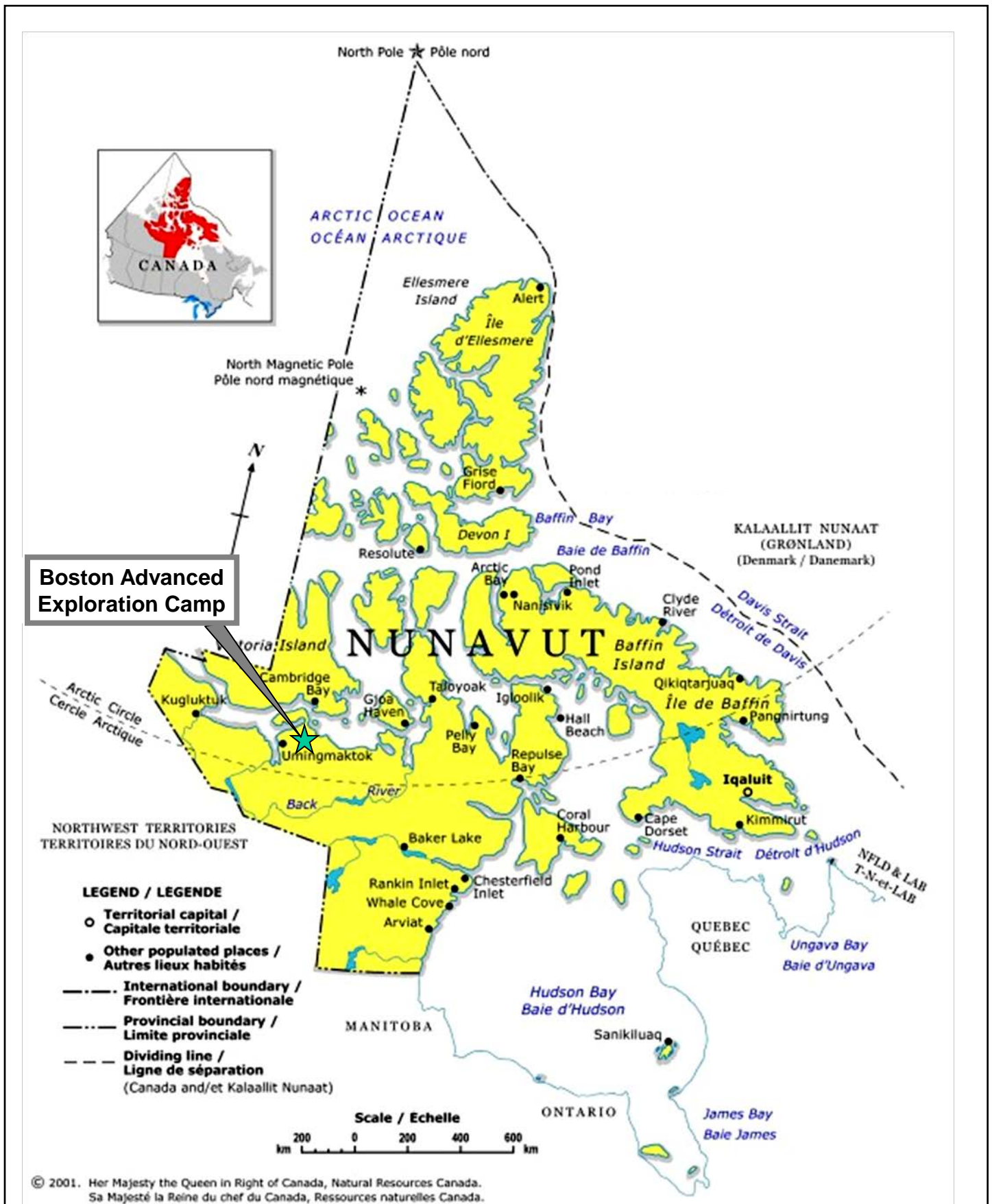
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Figures



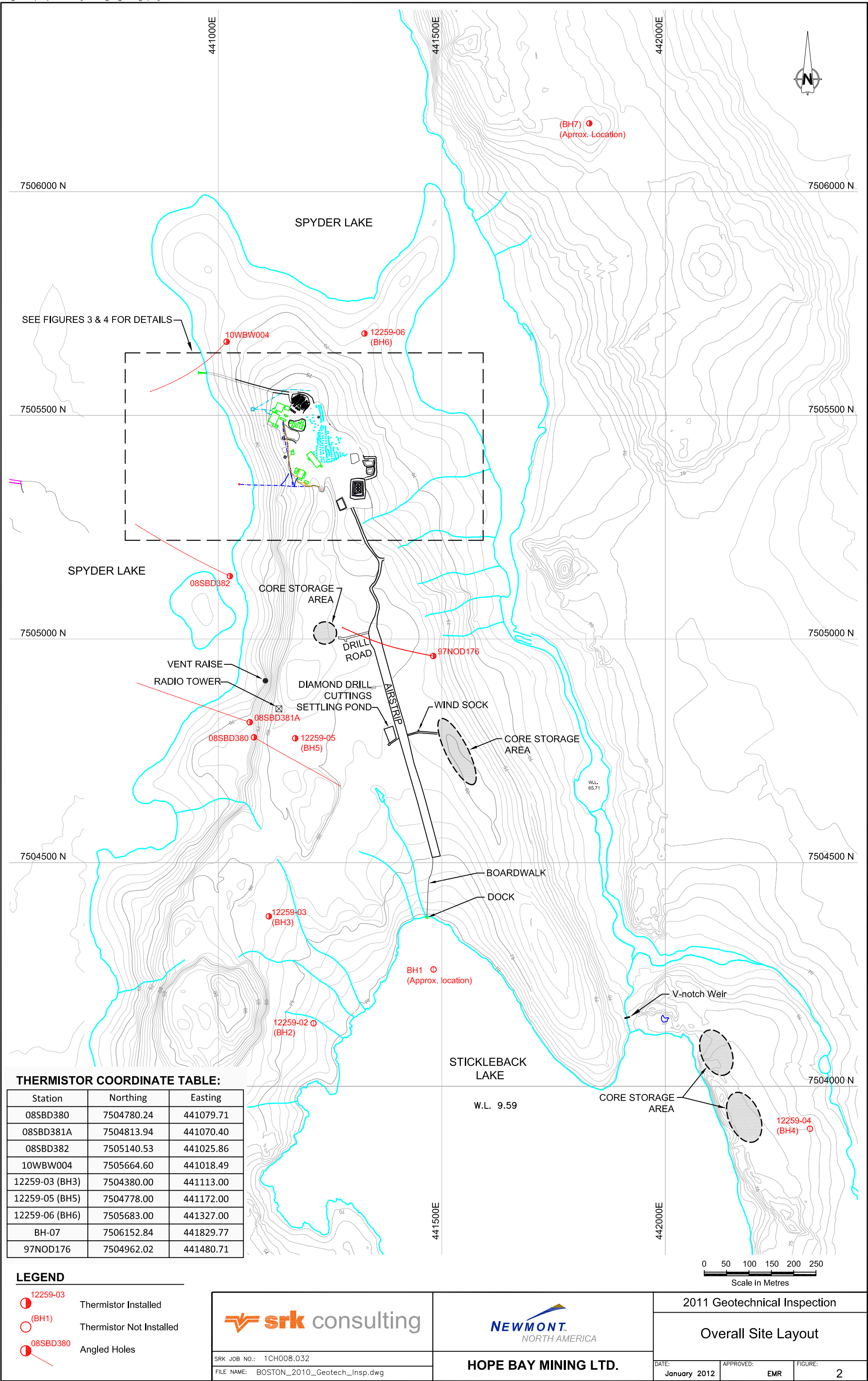




Photo Taken July 2009



SRK JOB NO.: 1CH008.046

FILE NAME: BOSTON_SitePlan_1CH008.046_Rev1_MMM.dwg



HOPE BAY MINING LTD.

2011 Geotechnical Inspection

**Boston Site Layout
Looking South-West**

DATE:

March 2012

APPROVED:

MMM

FIGURE:

3

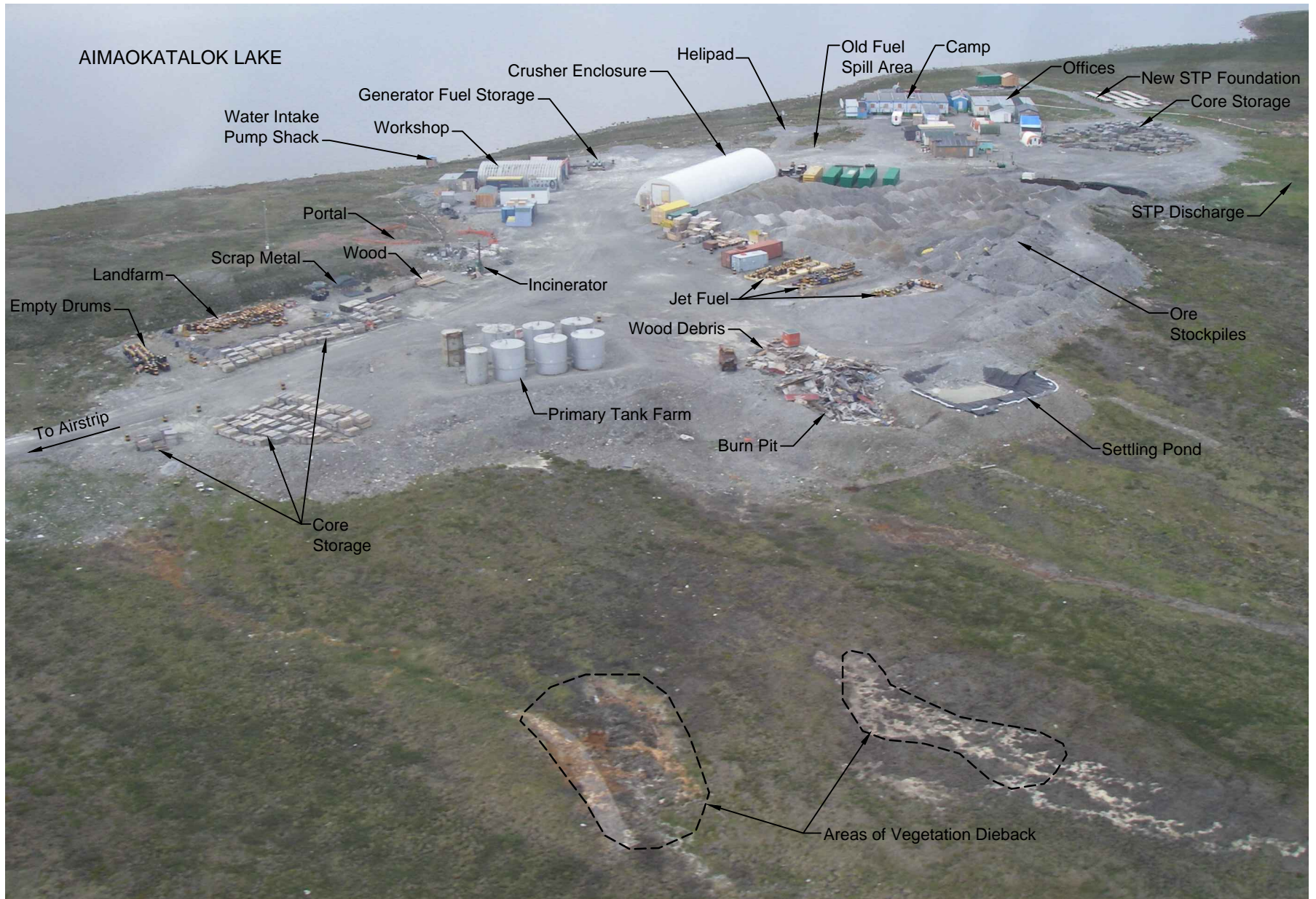


Photo Taken July 2009



SRK JOB NO.: 1CH008.046

FILE NAME: BOSTON_SitePlan_1CH008.046_Rev1_MMM.dwg



HOPE BAY MINING LTD.

2011 Geotechnical Inspection

**Boston Site Layout
Looking West**

DATE:

March 2012

APPROVED:

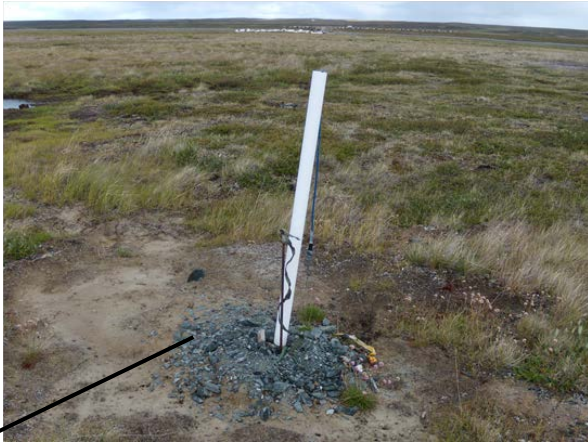
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FIGURE:

4



Drill hole 12259-06 (BH6) with thermistor string #1051.



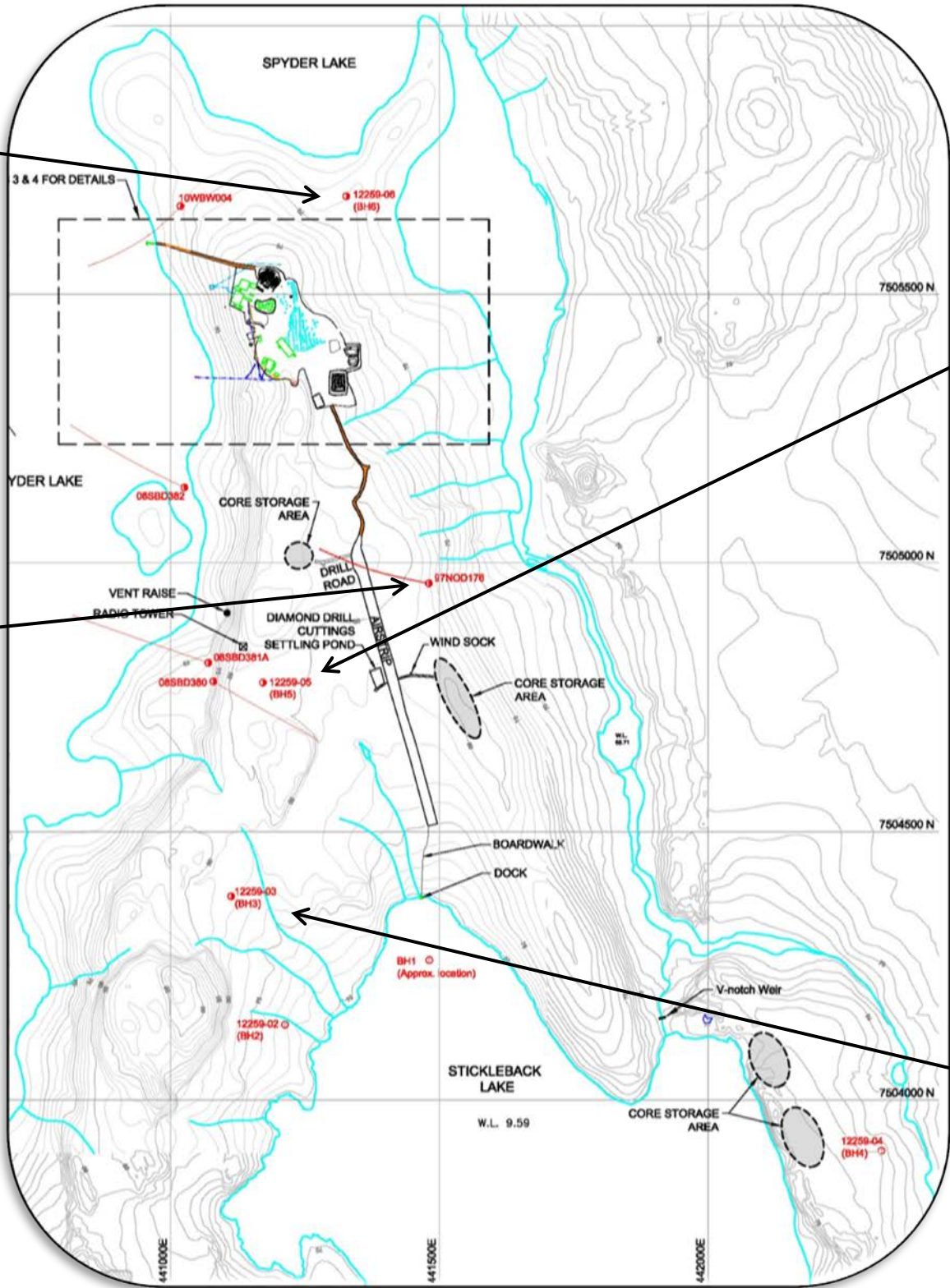
Drill hole 12259-05 (BH5) with thermistor string #1050.



Drill hole 97NOD176 with thermistor string.



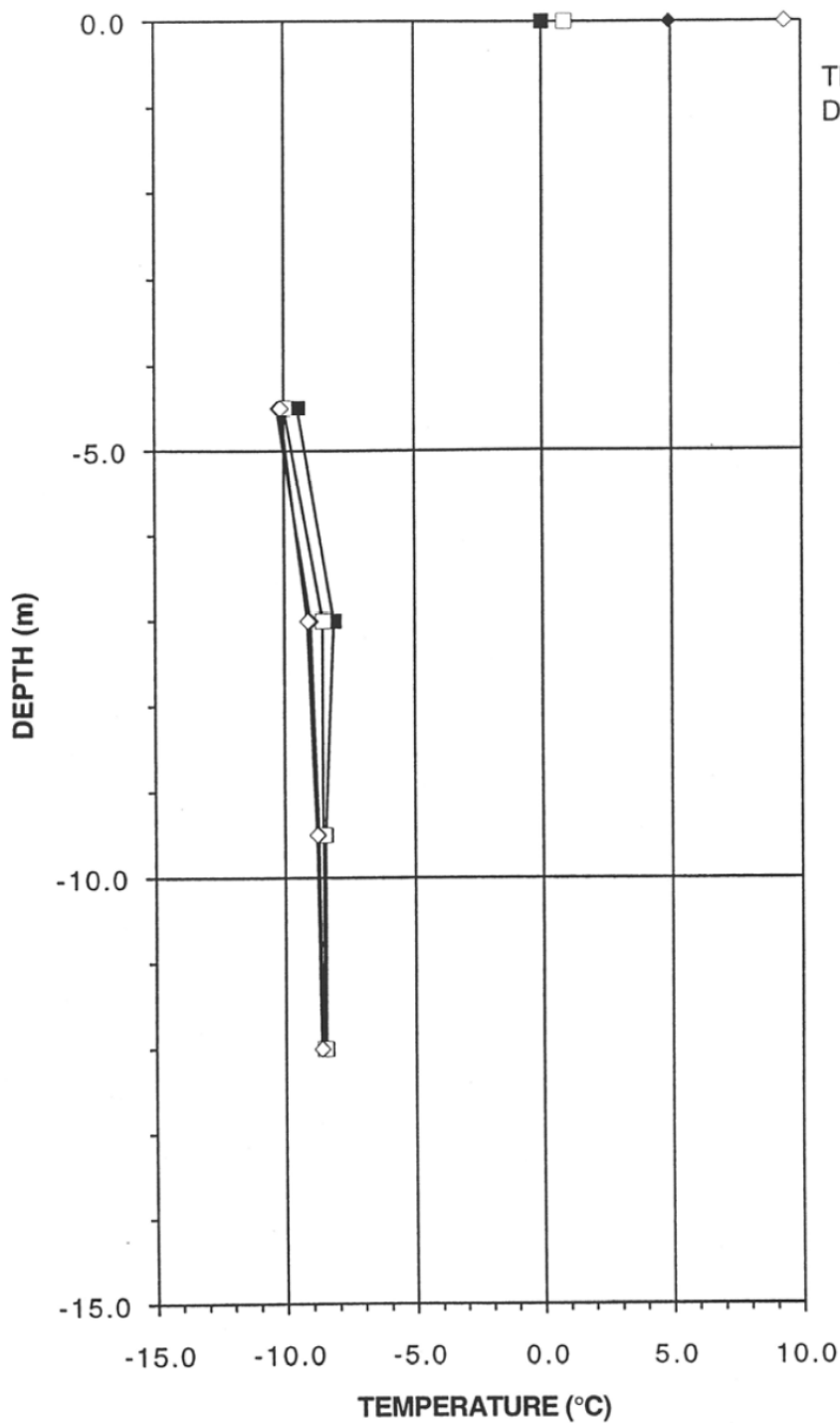
Close-up of the readout box and terminal connector for the thermistor string on drill hole 97NOD176.



Close-up of the severed cable on drill hole 12259-03 (BH3) with thermistor string #1049.



Drill hole 12259-03 (BH3) with thermistor string #1049. The cable has been severed.



Thermistor No.: 1049
Date Installed: 96-05-17

Source: Boston Gold Project – Surficial Geology and Permafrost Features,
EBA Engineering 1996



2011 Geotechnical Inspection

Ground Temperature Profiles EBA Drillhole 12259-03

Job No: 1CH008.046

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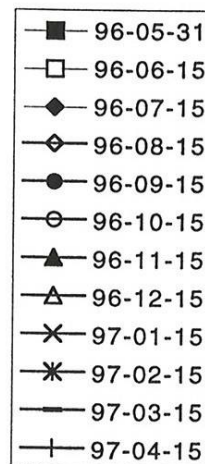
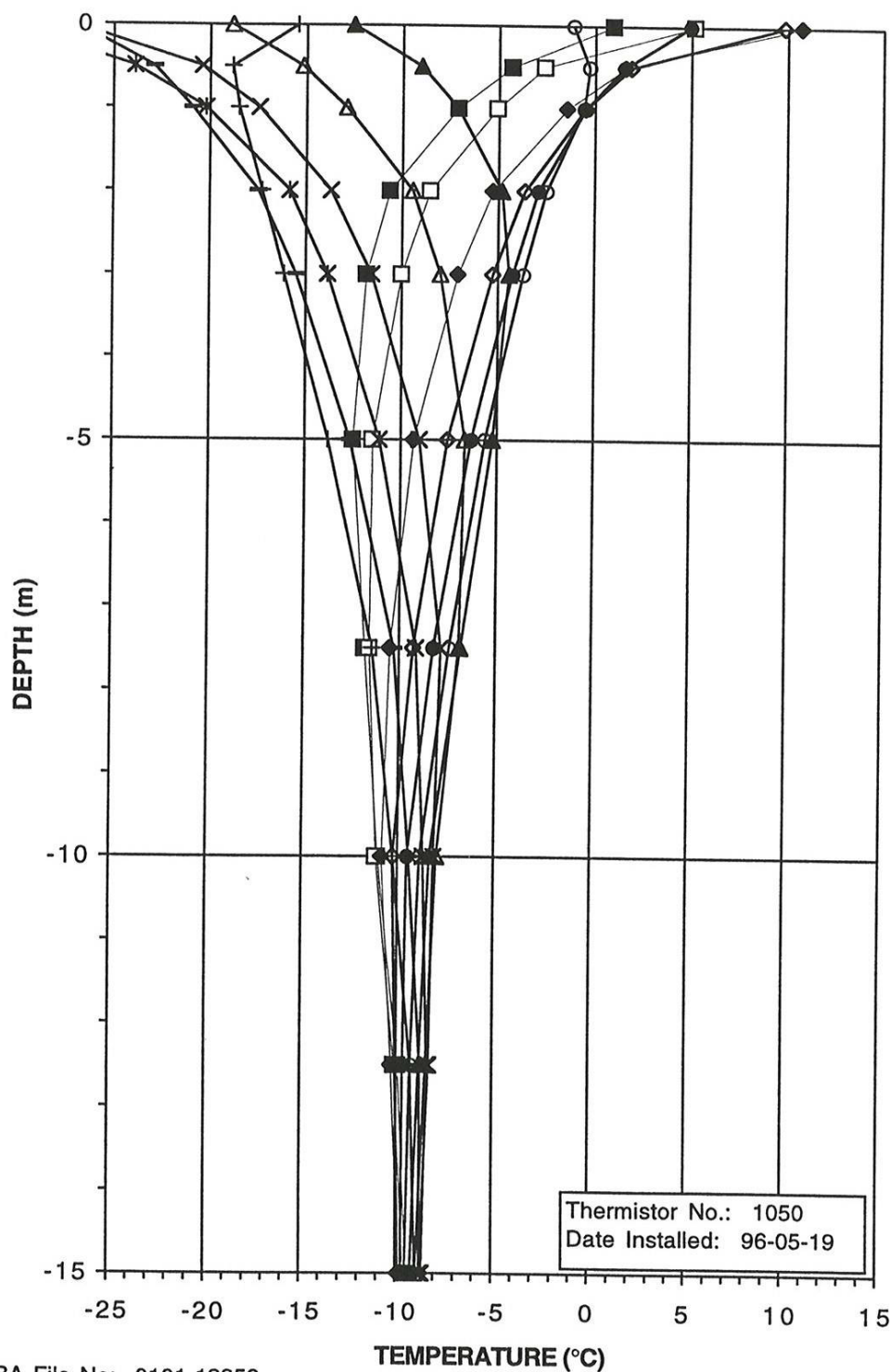
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March 2012

Approved:
EMR

Figure:

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Filename: Figure 6-9_EBA graphs_20110108.pptx



Source: Boston Technical Reports – Environmental General,
Tailings Disposal Evaluation-Draft, EBA Engineering 1997



2011 Geotechnical Inspection

Ground Temperature Profiles EBA Drillhole 12259-05

Job No: 1CH008.046

HOPE BAY MINING LTD.

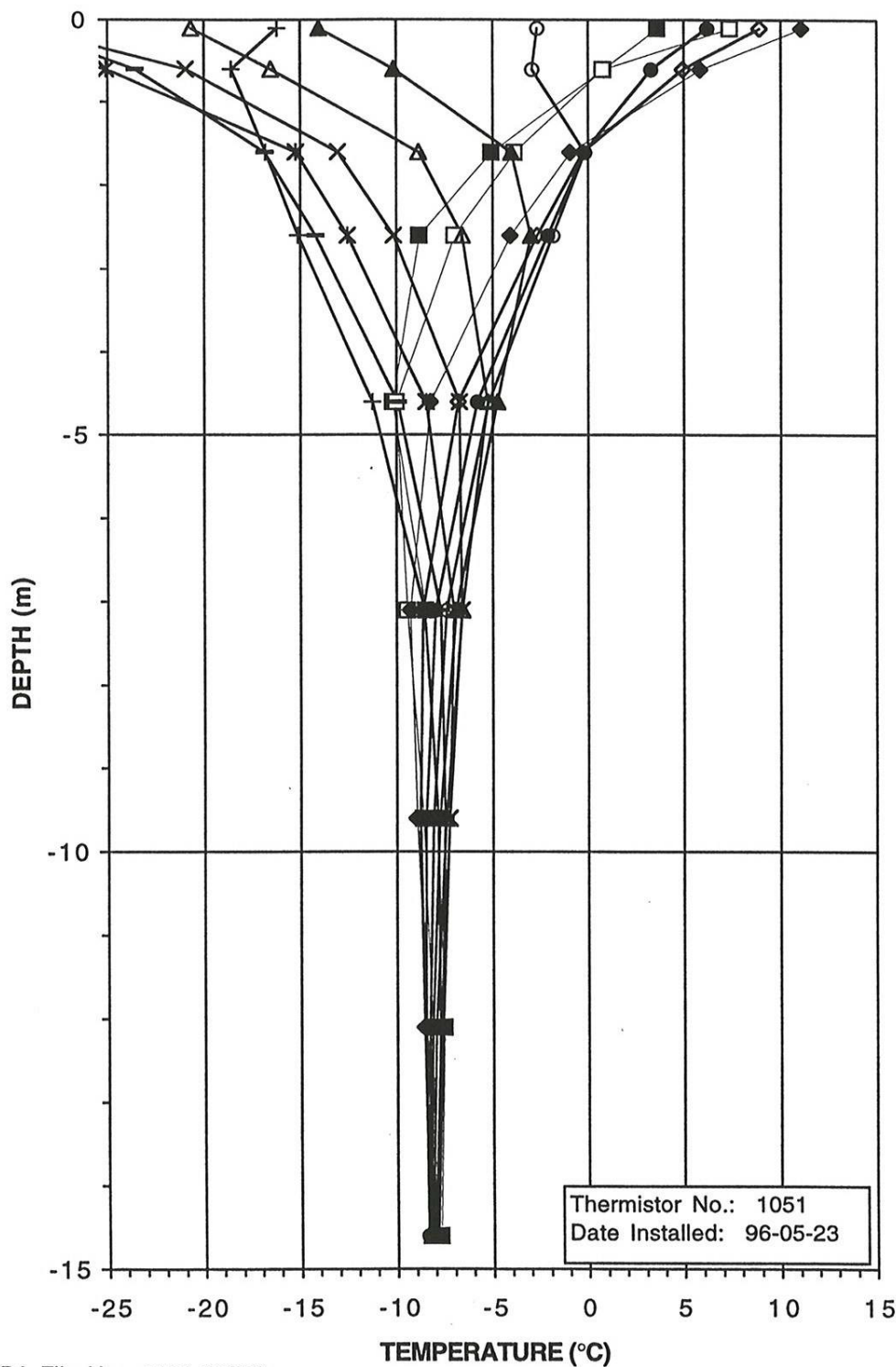
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EBA File No: 0101-12259



Source: Boston Technical Reports – Environmental General,
Tailings Disposal Evaluation-Draft, EBA Engineering 1997



2011 Geotechnical Inspection

**Ground Temperature Profiles
EBA Drillhole 12259-06**

Job No: 1CH008.046

HOPE BAY MINING LTD.

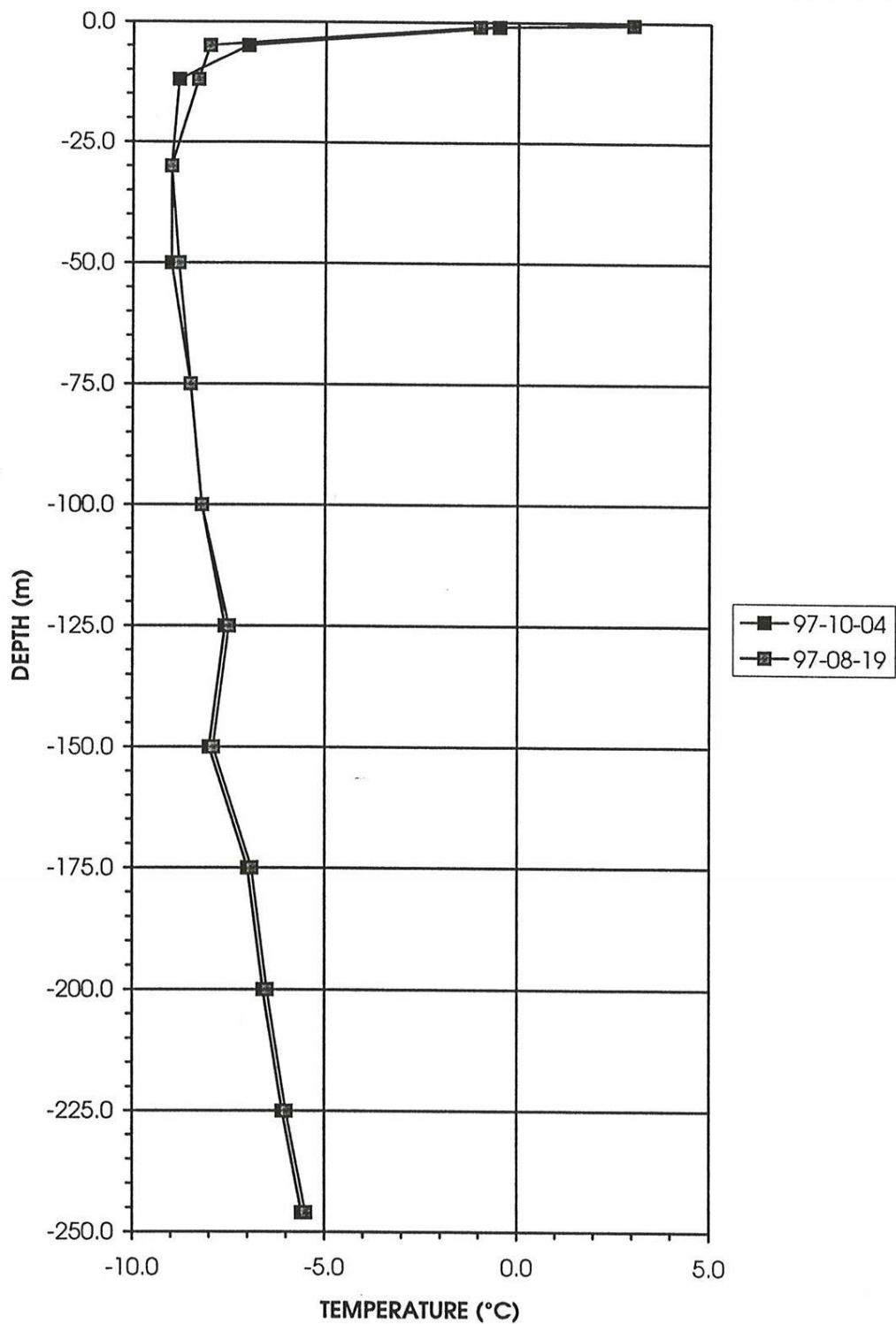
Date:
March 2012

Approved:
EMR

Figure:

8

Filename: Figure 6-9_EBA graphs_20110108.pptx



Source: Boston Technical Reports – Environmental General,
Tailings Disposal Evaluation-Draft, EBA Engineering 1997



2011 Geotechnical Inspection

Ground Temperature Profile EBA Deep Drillhole (97NOD176)

Job No: 1CH008.046

HOPE BAY MINING LTD.

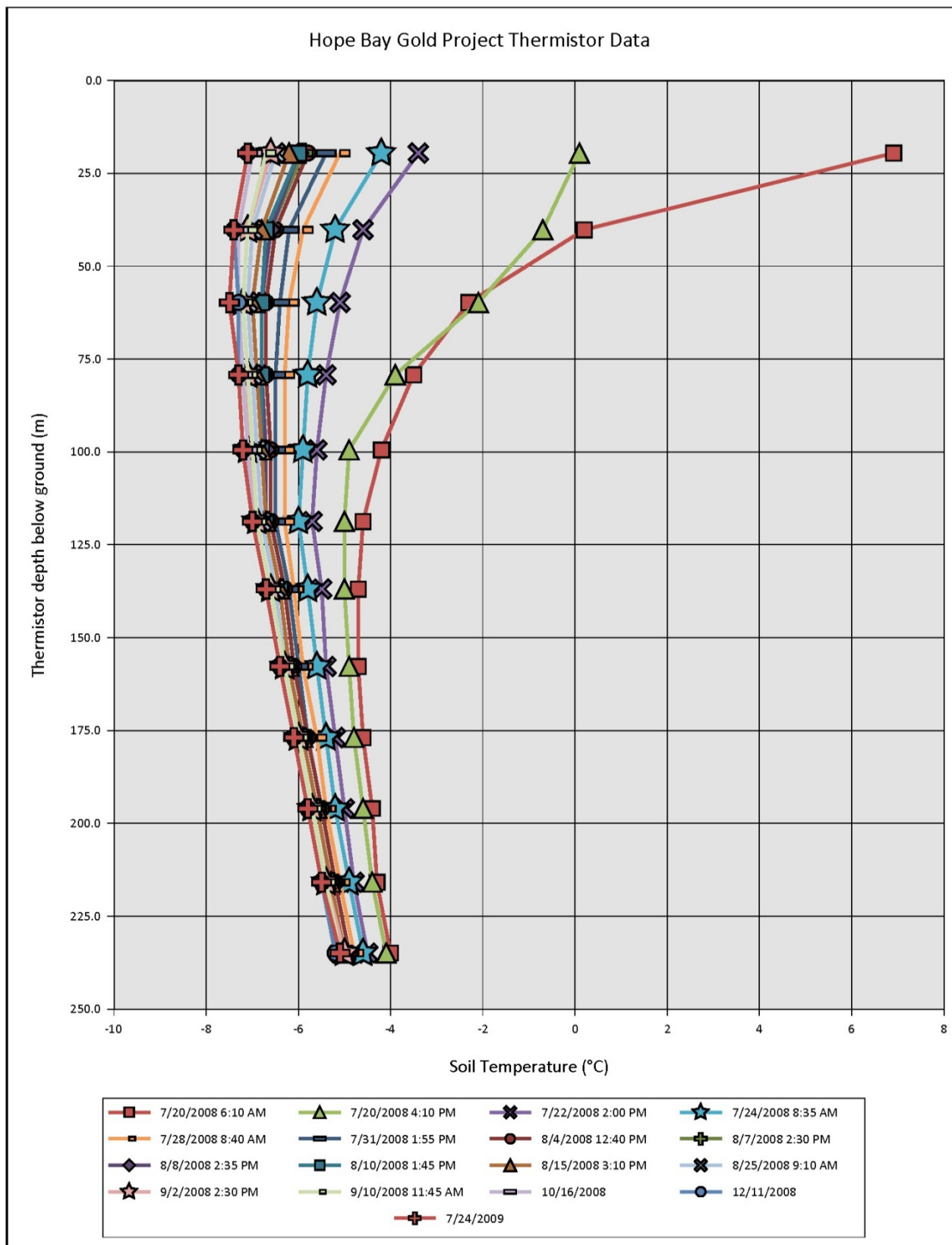
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March 2012

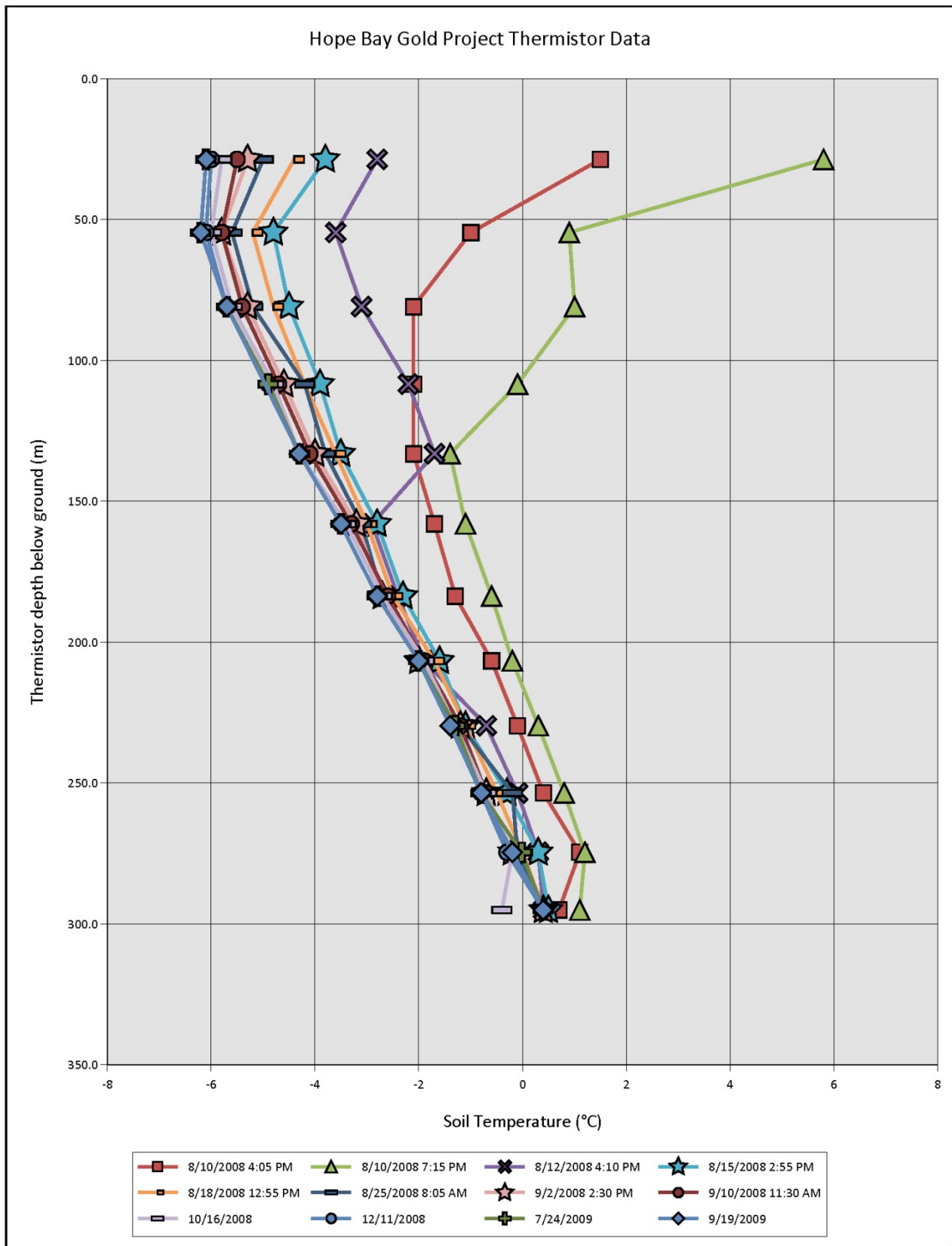
Approved:
EMR

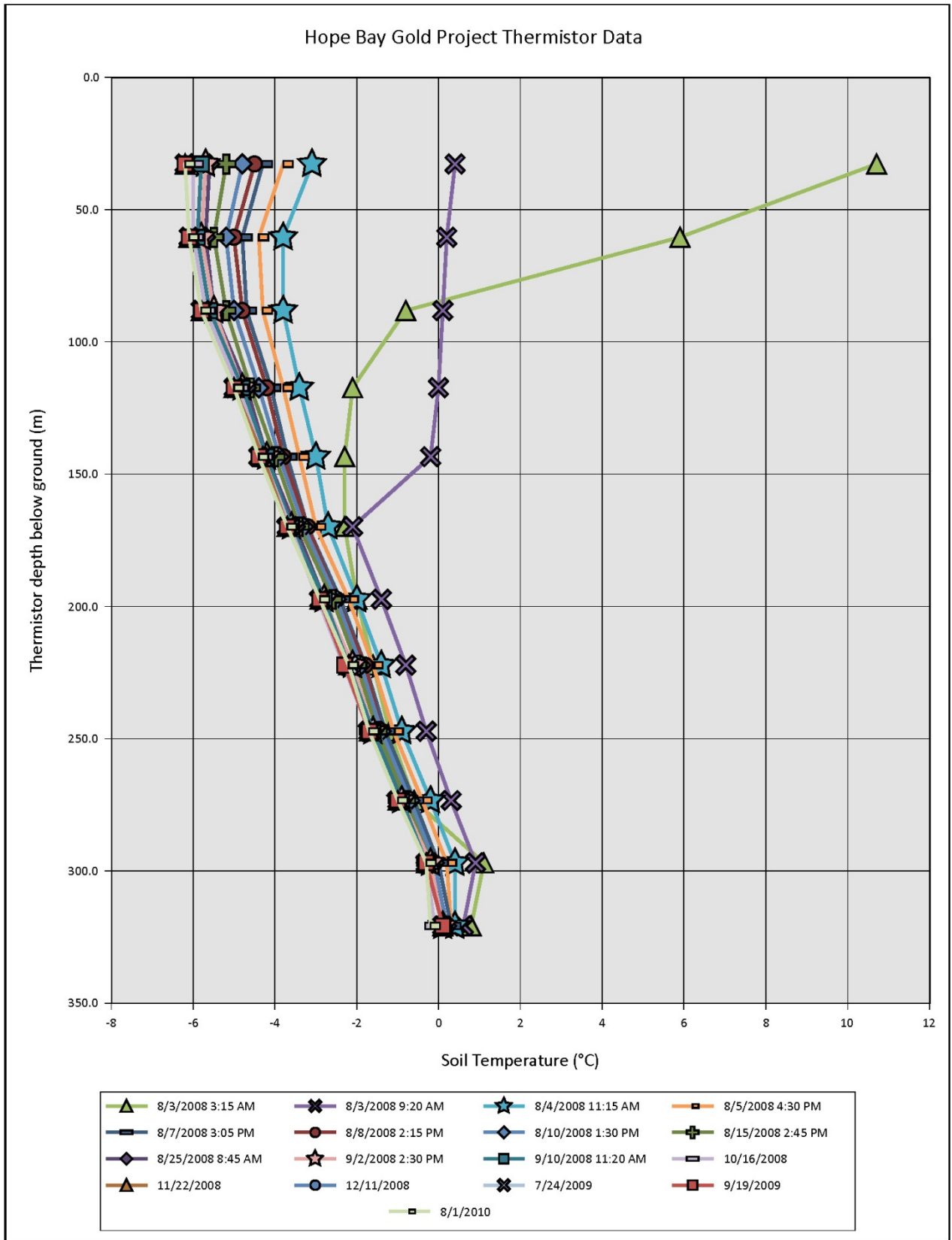
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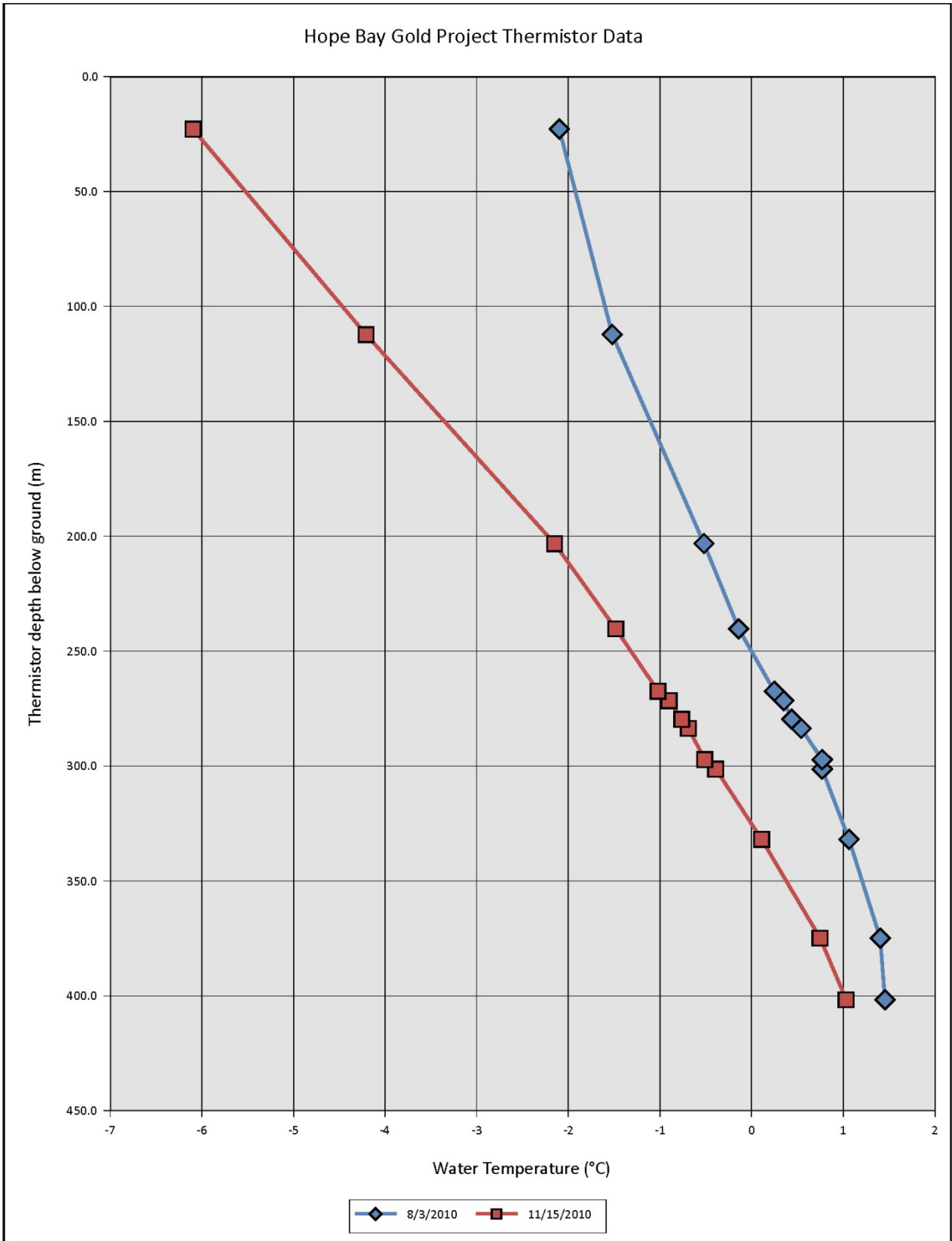
9

Filename: Figure 6-9_EBA graphs_20120308pptx











General view of the tank farm, looking east



Vehicle fueling station, looking northeast



Air-transportable fuel tanks in secondary containment. Photo looking northeast



Additional Envirotanks outside of the tank farm, secondary containment. Photo looking southwest



Looking north along the west side of the tank farm



Aerial view of the tank farm



Settlement deformation of the north berm of the tank farm





Looking west along the south end of the tank farm



Looking south along east side of the tank farm



Looking along the east containment berm, facing northeast

 Job No: 1CH008.046 Filename: Figure 14_PrimaryTankFarm.pptx	 HOPE BAY MINING LTD.	2011 Geotechnical Inspection		
		Primary Tank Farm		
		Date: March 2012	Approved: EMR	Figure: 14



Looking east behind the powerhouse (red building). Note backfill of erosion piles in the foreground.



Aerial view of crusher and shop area. Note ore stockpile on right side of photo.



Looking west toward the secondary containment of power plant/shop fuel supply.



Secondary containment of powerhouse and shops fuel supply. Photo looking northwest



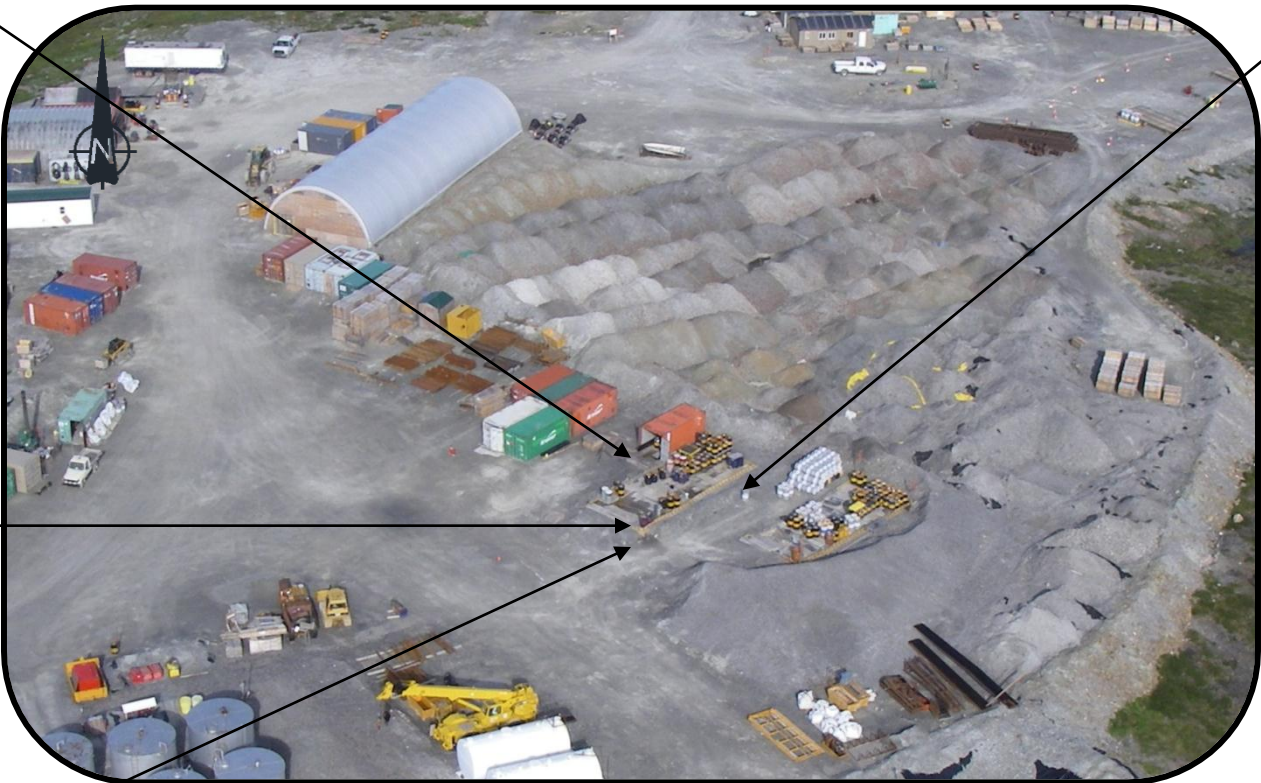
Northeast view of lubricant storage area



North view of lubricant storage area



Northeast view of lubricants storage area



General view of ore stockpile and fuel and lubricant storage area. The large building on the left is the old crusher building



Northwest view of lubricant storage area



Closer look at tears and rips in the liner



Folded portion of liner with tears and rips



Edge of pad and Sediment Pond Berm. Photo looking south



West side of Burn Pit



Southeast corner of Burn Pit



Berm between Burn Pit and Sediment Pond.
Photo looking west



Aerial view of Sediment Pond and Berm Pit



Edge of Sediment Pond berm, photo looking North



Northwest corner of Sediment Pond



Northeast corner of sediment pond



Job No: 1CH008.046
Filename: Figure 17_SedimentationPond&BurnPit.pptx



HOPE BAY MINING LTD.

2011 Geotechnical Inspection

Sediment Pond and Burn Pit

Date: March 2012	Approved: EMR	Figure: 17
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Aerial photograph of ore stockpiles



Aerial view of ore stockpiles



Oblique view of ore stockpiles. Photo looking southwest



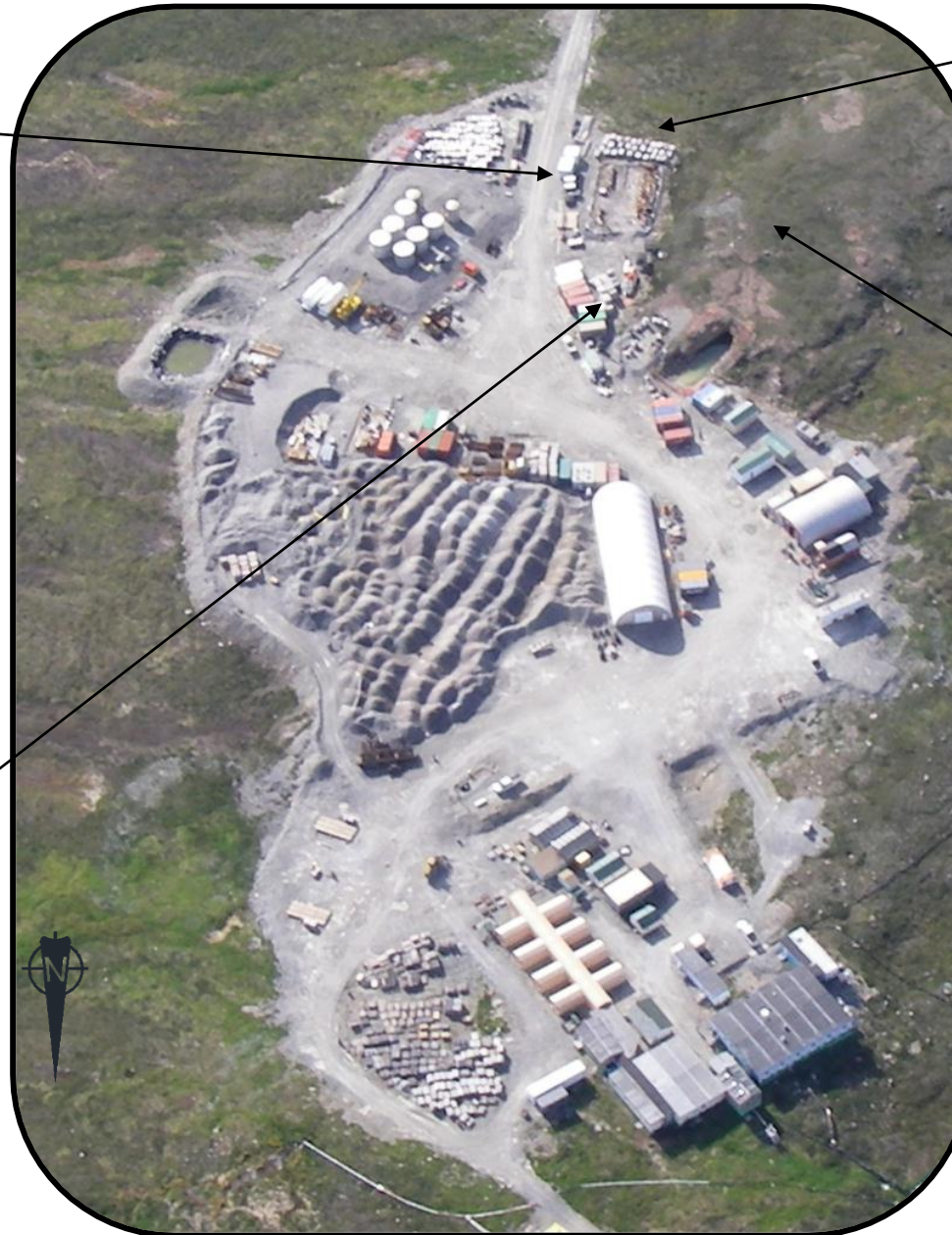
Closer look at edge of rockfill pad beside ore stockpile. Photo looking southeast



Looking east at Landfarm





Closer aerial view of Landfarm



View of north end of Landfarm, looking east



View of Bone Yard, photo looking East

		2011 Geotechnical Inspection		
		Landfarm and Bone Yard		
Job No: 1CH008.046 Filename: Figure 19_Landfarm&Boneyard.pptx	HOPE BAY MINING LTD.	Date: March 2012	Approved: EMR	Figure: 19



View of east side of Portal



Looking south across the Portal



View of west side of portal and protective fence along highwall



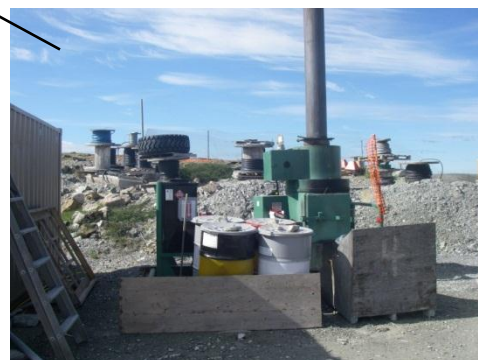
View of Portal from near portal highwall



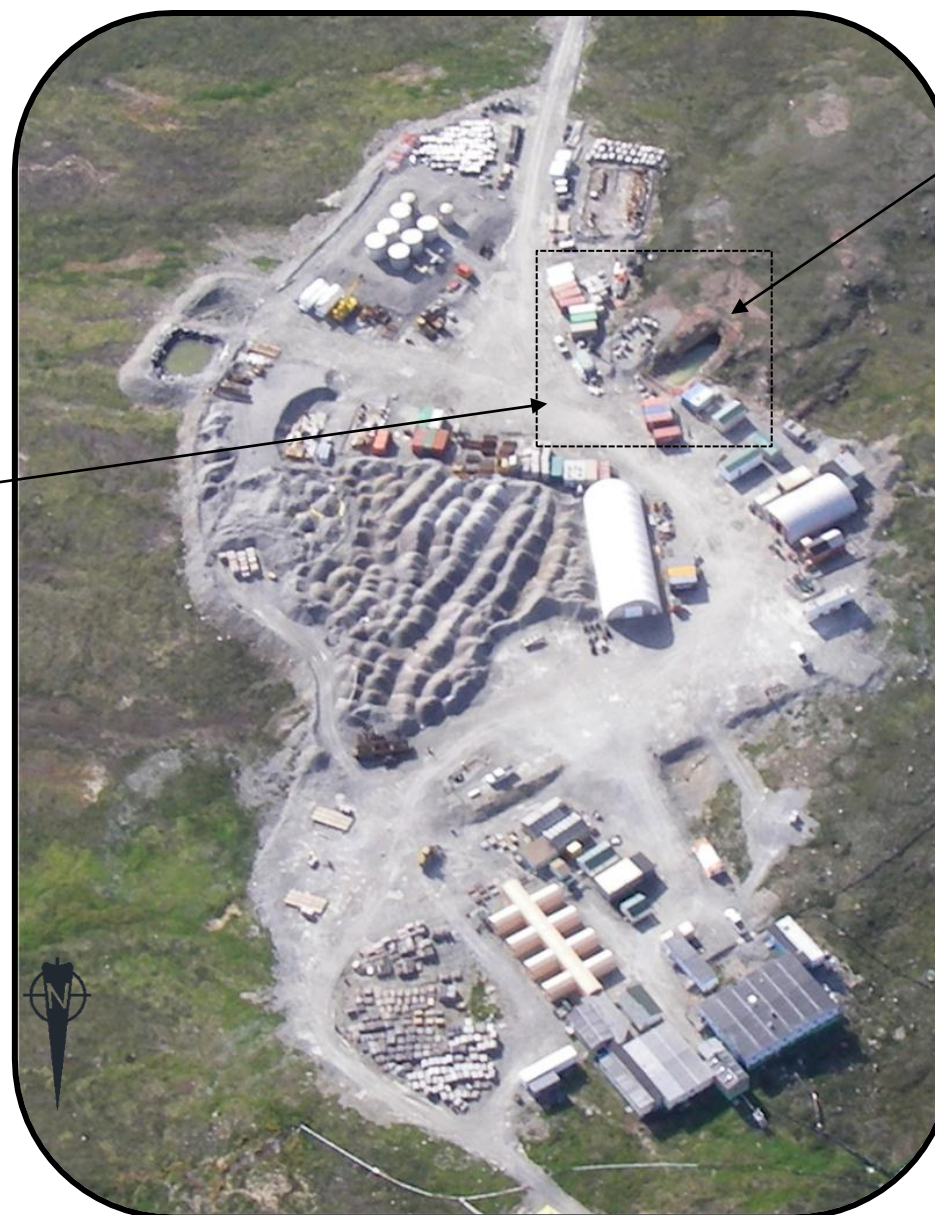
Oblique view of Boston Portal and incinerator



View of incinerator looking northeast



Closer view of incinerator. Photo looking southwest



Job No: 1CH008.046
Filename: Figure 20_Portal&IncineratorArea.pptx



HOPE BAY MINING LTD.

2011 Geotechnical Inspection

Portal and Incinerator Area

Date: March 2012	Approved: EMR	Figure: 20
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Looking north at core logging shed and offices. The depression in the foreground is the historic hydrocarbon spill



Trench on tundra filled with gravel



Fuel Tank with secondary containment berm on the east side of the complex



Looking west at pumphouse near the shore of Aimaokatalok Lake



Looking north along tundra at Camp Complex



Close up aerial view of camp areas and pumphouse



Aerial photo of Brine spill on east side of Airstrip



Core storage area on east side of Airstrip



Permafrost degradation along east side of Airstrip



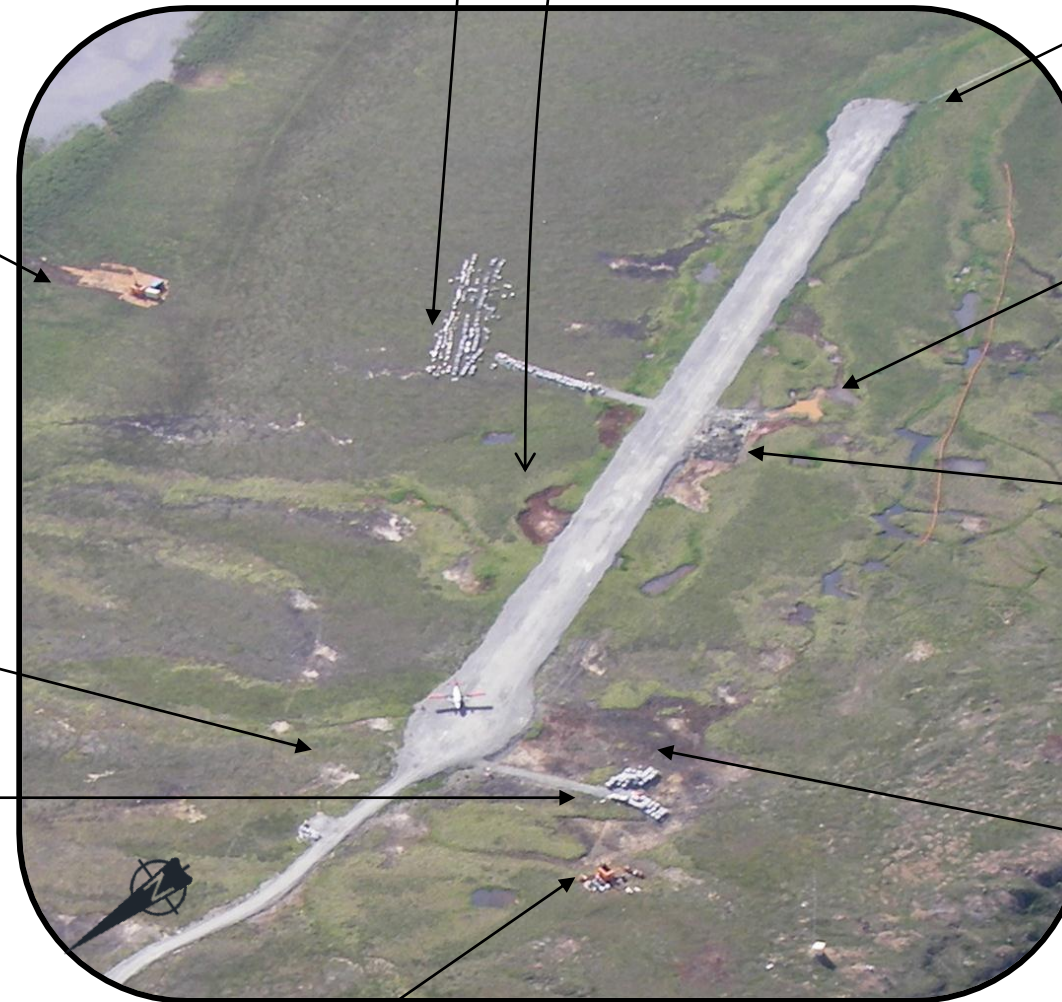
Boardwalk to boat dock on Stickleback Lake



Vegetation die-back on north end of Airstrip



Permafrost degradation and vegetation die-back



Vegetation die-back and permafrost degradation (background). Drill cuttings (foreground)





Core storage area on west side of Airstrip. Vegetation die-back and permafrost degradation visible.



Permafrost degradation and vegetation die-back



Drill located on northwest end of Airstrip, permafrost degradation and vegetation die-back

 Job No: 1CH008.046 Filename: Figure 22_Airstrip&VegetationDiebackAreas.pptx	 HOPE BAY MINING LTD.	2011 Geotechnical Inspection		
		Airstrip and Vegetation Dieback Areas Date: March 2012 Approved: EMR Figure: 22		



Enclosure for radio equipment installed on raised wooden foundation rock outcrop



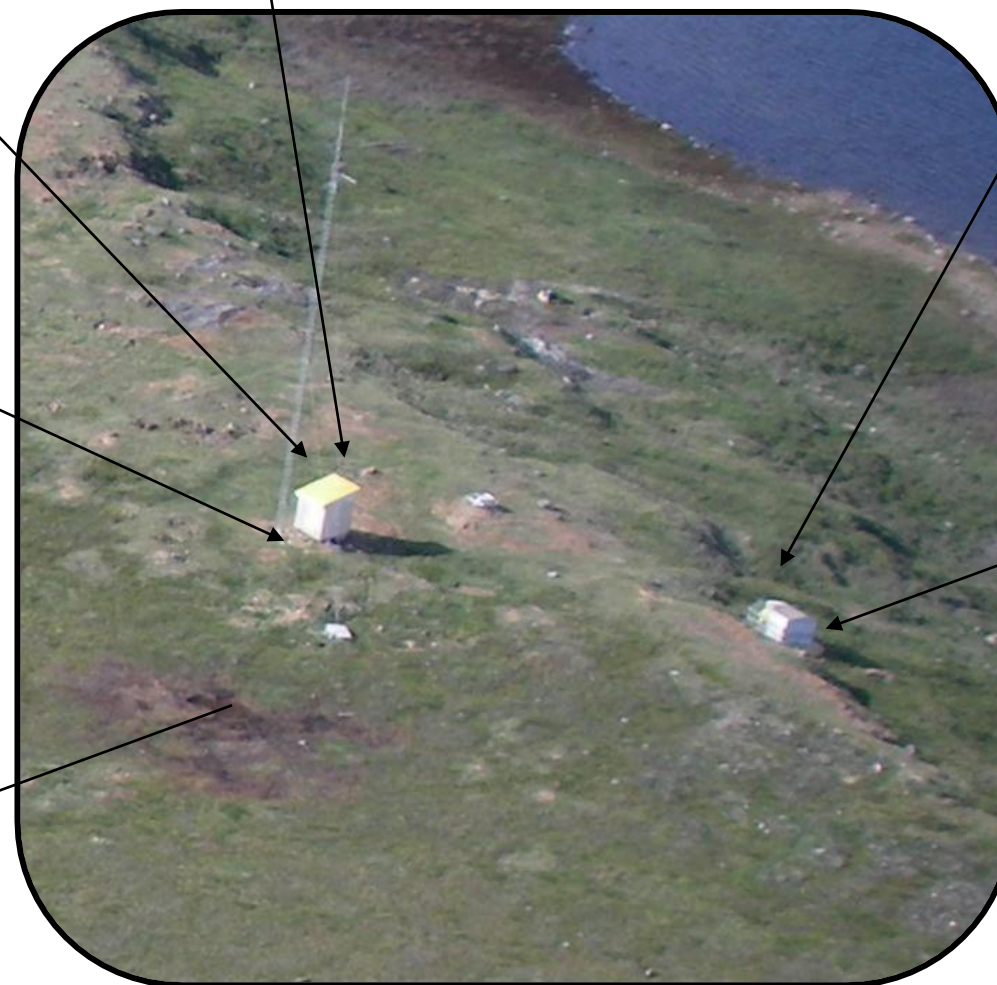
Looking north at enclosure for radio equipment



Looking north across the vent raise





Looking southwest at foundation of radio tower and enclosure for radio equipment

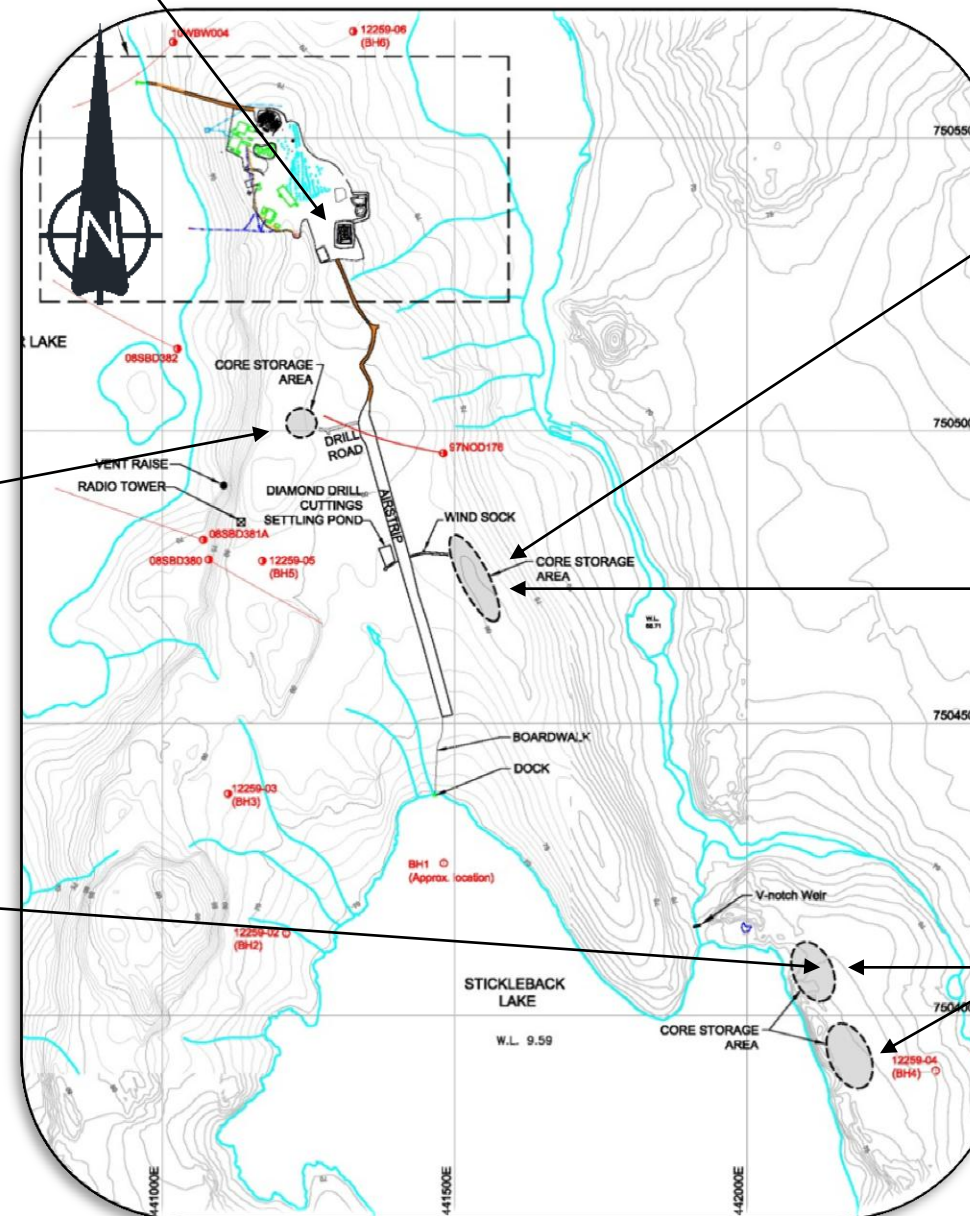


Looking south across vent raise



View of vent raise and radio tower location

		2011 Geotechnical Inspection		
		Radio Tower and Vent Raise		
Job No: 1CH008.046	HOPE BAY MINING LTD.	Date: March 2012	Approved: EMR	Figure: 23
Filename: Figure 23_RadioTower&VentRaise.pptx				





Pipe running from old sewage treatment to diffuser



Close up look at thermal pad and raised foundations of new sewage treatment plant



Closer look at foundations of old sewage treatment plant



New Boston sewage treatment plant



Diffuser for treated sewage effluent



Aerial photo of tundra downstream of treated sewage discharge point



Looking northeast at old sewage treatment plant (foreground) and new sewage treatment plant (right)

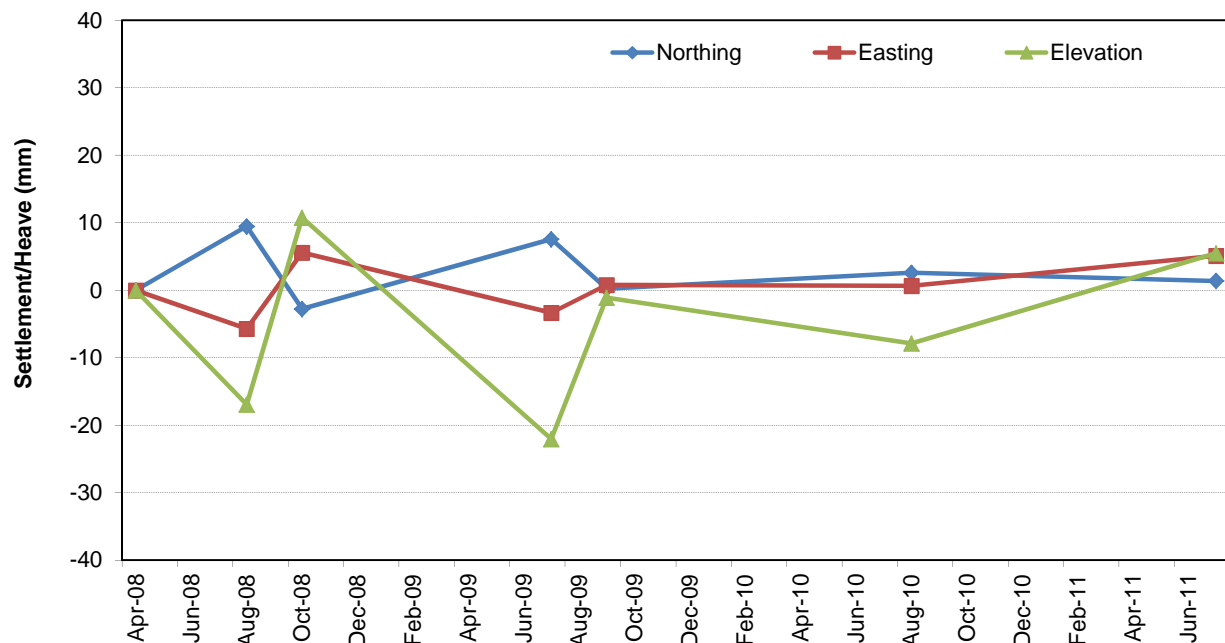
Appendix A
Boston Primary Fuel Tank Farm Settlement Monitoring

Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #1

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	1A	176	41	38	95	24	55	7.658	1.593	5325.879	1305.901	80.674			
8-Aug-08	1A	176	36	14	94	58	28	7.651	1.519	5325.889	1305.894	80.660	0.009	-0.008	-0.015
18-Oct-08	1A	176	38	26	96	3	2	7.675	1.674	5325.890	1305.905	80.669	0.001	0.011	0.009
25-Jul-09	1A	176	34	52	95	52	11	7.671	1.633	5325.896	1305.899	80.653	0.006	-0.005	-0.016
19-Sep-09	1A	176	35	8	95	53	35	7.676	1.635	5325.898	1305.904	80.651	0.002	0.004	-0.002
2-Aug-10	1A	176	34	14	94	58	19	7.666	1.506	5325.900	1305.904	80.646	0.003	0.000	-0.005
03-Jul-11	1A	176	40	40	94	12	40	7.672	1.416	5325.895	1305.923	80.657	-0.005	0.020	0.011
22-Apr-08	1B	58	18	6	94	2	11	9.526	1.632	5326.428	1308.581	80.989			
8-Aug-08	1B	58	19	39	92	54	1	9.527	1.436	5326.439	1308.574	80.982	0.011	-0.007	-0.008
18-Oct-08	1B	58	19	8	93	54	32	9.530	1.610	5326.434	1308.579	80.988	-0.005	0.005	0.006
25-Jul-09	1B	58	20	36	94	0	48	9.538	1.610	5326.441	1308.576	80.970	0.007	-0.003	-0.018
19-Sep-09	1B	58	20	27	94	6	27	9.541	1.626	5326.442	1308.574	80.971	0.001	-0.002	0.000
2-Aug-10	1B	58	20	28	93	19	3	9.533	1.484	5326.442	1308.574	80.960	0.000	0.000	-0.010
03-Jul-11	1B	58	20	53	92	29	57	9.529	1.350	5326.445	1308.572	80.962	0.003	-0.002	0.002
22-Apr-08	1F	304	22	12	91	9	4	24.193	1.635	5328.263	1306.711	80.992			
8-Aug-08	1F	304	22	16	91	4	38	24.184	1.575	5328.271	1306.709	80.963	0.008	-0.002	-0.029
18-Oct-08	1F	304	22	16	91	11	6	24.189	1.637	5328.267	1306.710	80.980	-0.004	0.001	0.016
25-Jul-09	1F	304	22	13	91	0	29	24.178	1.530	5328.276	1306.708	80.948	0.009	-0.002	-0.032
19-Sep-09	1F	304	22	18	91	15	12	24.182	1.632	5328.274	1306.708	80.946	-0.002	0.000	-0.002
2-Aug-10	1F	304	21	53	91	2	35	24.176	1.535	5328.279	1306.710	80.938	0.005	0.002	-0.008
03-Jul-11	1F	304	22	2	91	0	43	24.169	1.525	5328.285	1306.707	80.941	0.006	-0.003	0.003

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	9.5	-5.7	-17.0
	18-Oct-08	-2.8	5.6	10.7
	25-Jul-09	7.6	-3.3	-22.1
	19-Sep-09	0.2	0.8	-1.1
	2-Aug-10	2.6	0.7	-7.9
3-Jul-11		1.4	5.1	5.5
OVERALL PERIOD AVERAGE (mm)		3.1	0.5	-5.3

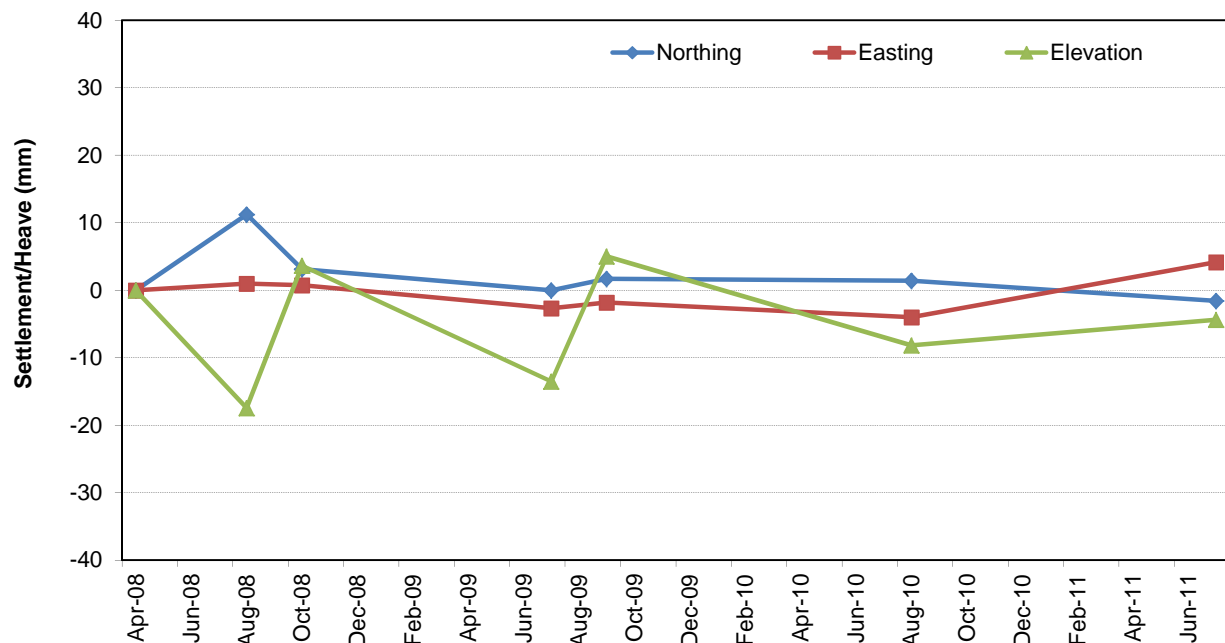


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #2

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	2A	188	32	48	91	42	56	17.357	1.593	5327.678	1315.749	80.877			
8-Aug-08	2A	188	30	39	91	31	5	17.357	1.519	5327.689	1315.747	80.863	0.011	-0.002	-0.014
18-Oct-08	2A	188	30	44	92	1	58	17.369	1.674	5327.691	1315.754	80.862	0.002	0.007	-0.001
25-Jul-09	2A	188	30	41	91	55	2	17.365	1.633	5327.690	1315.752	80.856	-0.001	-0.003	-0.006
19-Sep-09	2A	188	30	32	91	55	46	17.369	1.635	5327.692	1315.755	80.854	0.002	0.003	-0.002
2-Aug-10	2A	188	29	57	91	32	0	17.365	1.506	5327.695	1315.754	80.845	0.003	-0.001	-0.009
03-Jul-11	2A	188	33	14	91	12	31	17.379	1.416	5327.684	1315.775	80.853	-0.010	0.021	0.008
22-Apr-08	2C	66	46	17	93	28	22	8.891	1.669	5326.866	1318.217	81.190			
8-Aug-08	2C	66	49	58	92	18	25	8.890	1.471	5326.878	1318.219	81.173	0.012	0.002	-0.017
18-Oct-08	2C	66	51	15	93	13	45	8.903	1.625	5326.885	1318.217	81.183	0.007	-0.002	0.010
25-Jul-09	2C	66	51	14	93	4	54	8.903	1.592	5326.886	1318.216	81.173	0.001	-0.001	-0.010
19-Sep-09	2C	66	51	2	93	15	9	8.907	1.622	5326.887	1318.214	81.177	0.002	-0.002	0.003
2-Aug-10	2C	66	50	58	92	42	58	8.906	1.532	5326.889	1318.212	81.170	0.002	-0.002	-0.007
03-Jul-11	2C	66	50	6	91	50	37	8.905	1.380	5326.891	1318.207	81.154	0.002	-0.005	-0.016
22-Apr-08	2D	284	9	33	90	41	36	22.748	1.669	5329.353	1318.048	81.114			
8-Aug-08	2D	284	9	30	90	25	53	22.736	1.544	5329.363	1318.052	81.093	0.010	0.003	-0.021
18-Oct-08	2D	284	9	59	90	37	33	22.737	1.623	5329.364	1318.048	81.095	0.001	-0.003	0.002
25-Jul-09	2D	284	10	37	90	30	59	22.738	1.555	5329.364	1318.044	81.070	0.000	-0.004	-0.025
19-Sep-09	2D	284	11	40	90	24	42	22.738	1.527	5329.365	1318.037	81.084	0.002	-0.007	0.014
2-Aug-10	2D	284	12	51	90	23	29	22.741	1.510	5329.364	1318.029	81.075	-0.001	-0.008	-0.009
03-Jul-11	2D	284	13	33	90	1	32	22.738	1.360	5329.368	1318.025	81.070	0.004	-0.004	-0.005

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	11.2	1.0	-17.5
	18-Oct-08	3.1	0.7	3.6
	25-Jul-09	0.0	-2.7	-13.5
	19-Sep-09	1.7	-1.8	5.0
	2-Aug-10	1.4	-4.0	-8.2
	3-Jul-11	-1.6	4.2	-4.4
OVERALL PERIOD AVERAGE (mm)		2.6	-0.4	-5.8

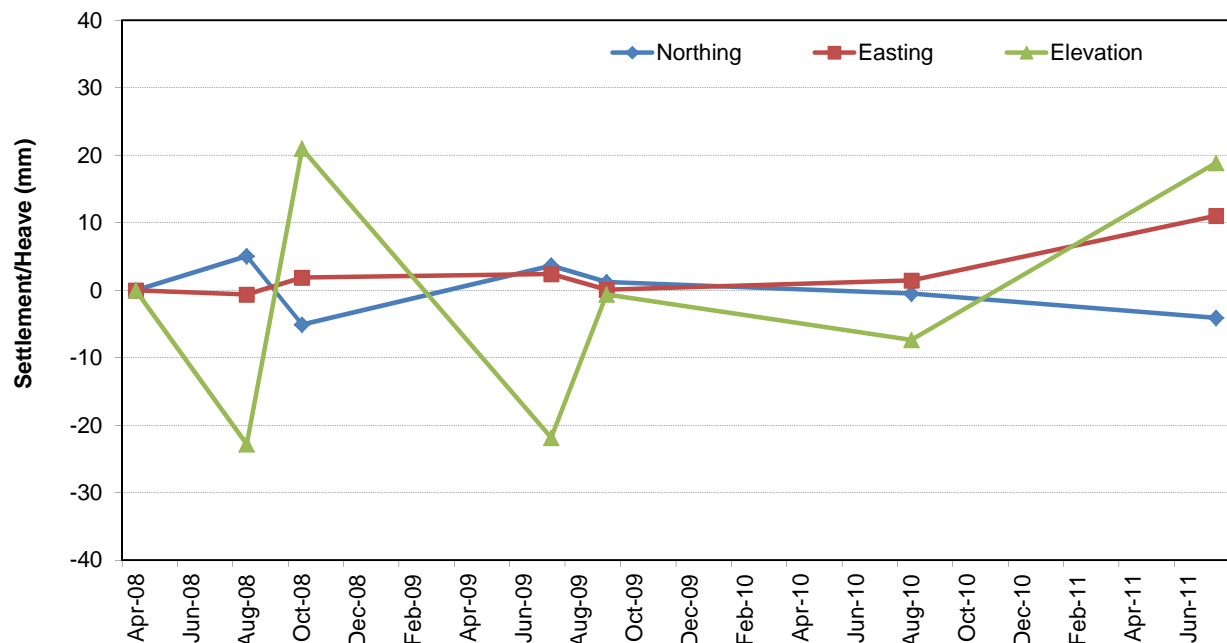


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #3

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	3A	155	31	38	91	35	38	12.238	1.593	5331.618	1306.850	81.057			
8-Aug-08	3A	155	29	54	91	20	3	12.240	1.519	5331.624	1306.847	81.038	0.006	-0.003	-0.019
18-Oct-08	3A	155	31	55	91	58	52	12.245	1.674	5331.621	1306.853	81.055	-0.004	0.006	0.017
25-Jul-09	3A	155	31	45	91	51	50	12.248	1.633	5331.624	1306.855	81.039	0.003	0.002	-0.016
19-Sep-09	3A	155	32	4	91	52	38	12.252	1.635	5331.627	1306.858	81.038	0.002	0.003	-0.001
2-Aug-10	3A	155	32	17	91	17	55	12.249	1.506	5331.627	1306.859	81.032	0.000	0.001	-0.005
03-Jul-11	3A	155	40	17	90	46	7	12.254	1.416	5331.615	1306.886	81.056	-0.012	0.027	0.023
22-Apr-08	3B	80	36	8	92	41	45	12.708	1.632	5331.612	1309.744	81.062			
8-Aug-08	3B	80	36	38	91	53	10	12.706	1.436	5331.618	1309.743	81.046	0.005	-0.001	-0.016
18-Oct-08	3B	80	35	55	92	35	15	12.708	1.610	5331.613	1309.743	81.064	-0.005	0.000	0.018
25-Jul-09	3B	80	37	13	92	40	40	12.710	1.610	5331.616	1309.747	81.044	0.003	0.004	-0.020
19-Sep-09	3B	80	36	53	92	44	55	12.713	1.626	5331.618	1309.744	81.044	0.001	-0.002	0.000
2-Aug-10	3B	80	36	42	92	9	22	12.704	1.484	5331.614	1309.745	81.034	-0.003	0.001	-0.010
03-Jul-11	3B	80	37	15	91	30	35	12.693	1.350	5331.610	1309.750	81.044	-0.005	0.005	0.010
22-Apr-08	3F	297	17	27	91	16	38	17.426	1.635	5335.467	1307.263	81.090			
8-Aug-08	3F	297	16	52	91	11	23	17.423	1.575	5335.470	1307.265	81.056	0.003	0.002	-0.033
18-Oct-08	3F	297	17	24	91	18	7	17.430	1.637	5335.464	1307.265	81.084	-0.007	0.000	0.028
25-Jul-09	3F	297	16	48	91	2	50	17.425	1.530	5335.468	1307.267	81.055	0.004	0.002	-0.029
19-Sep-09	3F	297	16	57	91	23	10	17.427	1.632	5335.468	1307.266	81.053	0.000	-0.001	-0.001
2-Aug-10	3F	297	16	23	91	5	19	17.424	1.535	5335.470	1307.268	81.047	0.002	0.002	-0.006
03-Jul-11	3F	297	15	52	90	58	40	17.420	1.525	5335.474	1307.269	81.071	0.004	0.001	0.024

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	5.1	-0.6	-22.8
	18-Oct-08	-5.1	1.9	21.0
	25-Jul-09	3.7	2.4	-21.9
	19-Sep-09	1.2	0.1	-0.6
	2-Aug-10	-0.5	1.4	-7.3
	3-Jul-11	-4.1	11.0	18.8
OVERALL PERIOD AVERAGE (mm)		0.0	2.7	-2.1

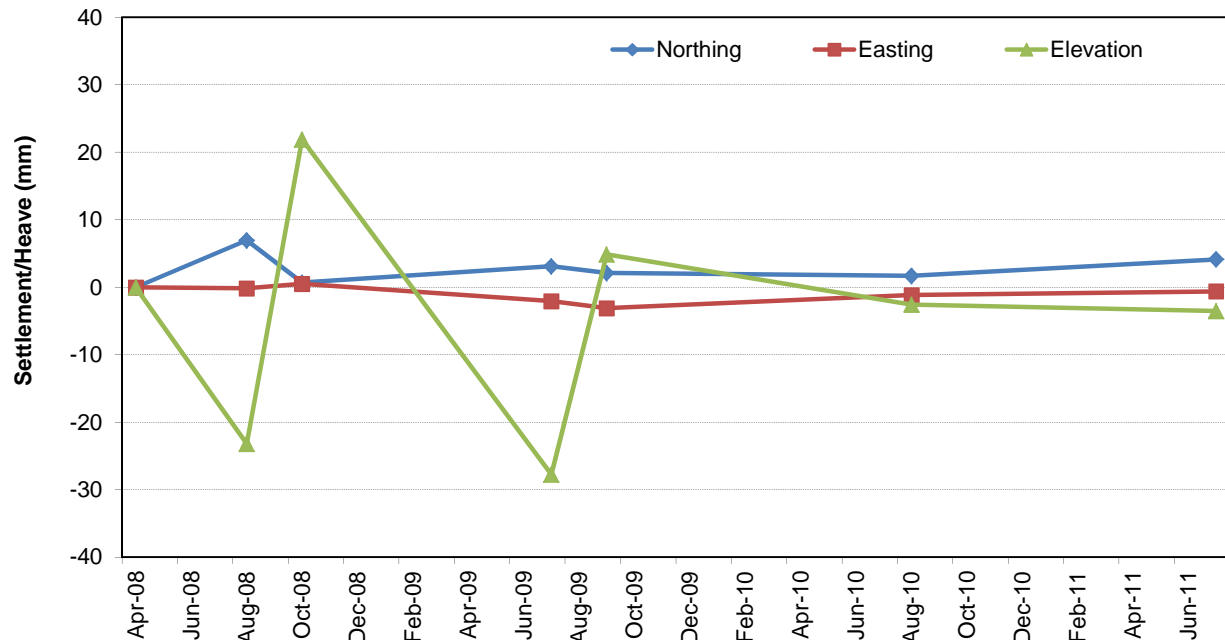


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #4

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	4C	79	49	37	92	45	46	12.465	1.669	5331.166	1318.159	81.128			
8-Aug-08	4C	79	50	23	91	56	16	12.462	1.471	5331.171	1318.159	81.110	0.005	0.000	-0.019
18-Oct-08	4C	79	51	33	92	32	3	12.471	1.625	5331.177	1318.161	81.134	0.005	0.002	0.024
25-Jul-09	4C	79	51	5	92	28	57	12.473	1.592	5331.178	1318.158	81.112	0.001	-0.003	-0.022
19-Sep-09	4C	79	51	1	92	36	19	12.478	1.622	5331.181	1318.156	81.115	0.003	-0.002	0.003
2-Aug-10	4C	79	50	58	92	12	5	12.474	1.532	5331.181	1318.156	81.113	0.000	0.000	-0.002
03-Jul-11	4C	79	51	1	91	33	38	12.472	1.380	5331.183	1318.155	81.100	0.002	-0.001	-0.013
22-Apr-08	4D	290	20	35	90	57	25	17.796	1.669	5334.739	1317.563	81.092			
8-Aug-08	4D	290	20	54	90	36	59	17.789	1.544	5334.744	1317.564	81.073	0.006	0.001	-0.019
18-Oct-08	4D	290	20	51	90	49	8	17.792	1.623	5334.742	1317.563	81.089	-0.002	-0.001	0.016
25-Jul-09	4D	290	21	32	90	42	58	17.791	1.555	5334.744	1317.560	81.053	0.002	-0.003	-0.036
19-Sep-09	4D	290	22	47	90	35	22	17.795	1.527	5334.742	1317.552	81.064	-0.002	-0.008	0.011
2-Aug-10	4D	290	23	44	90	32	36	17.796	1.510	5334.743	1317.547	81.061	0.001	-0.005	-0.003
03-Jul-11	4D	290	24	7	90	3	28	17.793	1.360	5334.746	1317.546	81.062	0.003	-0.001	0.001
22-Apr-08	4E	298	41	4	91	11	45	18.548	1.670	5334.220	1314.710	81.128			
8-Aug-08	4E	298	40	52	91	1	34	18.537	1.583	5334.230	1314.708	81.096	0.010	-0.001	-0.032
18-Oct-08	4E	298	40	53	91	9	14	18.539	1.650	5334.229	1314.709	81.122	-0.001	0.000	0.026
25-Jul-09	4E	298	40	41	91	0	14	18.532	1.576	5334.235	1314.708	81.096	0.006	0.000	-0.025
19-Sep-09	4E	298	40	23	91	6	42	18.528	1.611	5334.240	1314.709	81.097	0.005	0.000	0.000
2-Aug-10	4E	298	39	54	90	58	23	18.523	1.563	5334.245	1314.710	81.093	0.005	0.001	-0.003
03-Jul-11	4E	298	39	31	90	45	45	18.515	1.496	5334.252	1314.710	81.095	0.007	0.000	0.001

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	6.9	-0.2	-23.2
	18-Oct-08	0.7	0.5	21.9
	25-Jul-09	3.1	-2.1	-27.8
	19-Sep-09	2.1	-3.1	4.9
	2-Aug-10	1.7	-1.2	-2.6
OVERALL PERIOD AVERAGE (mm)		3.1	-1.1	-5.0

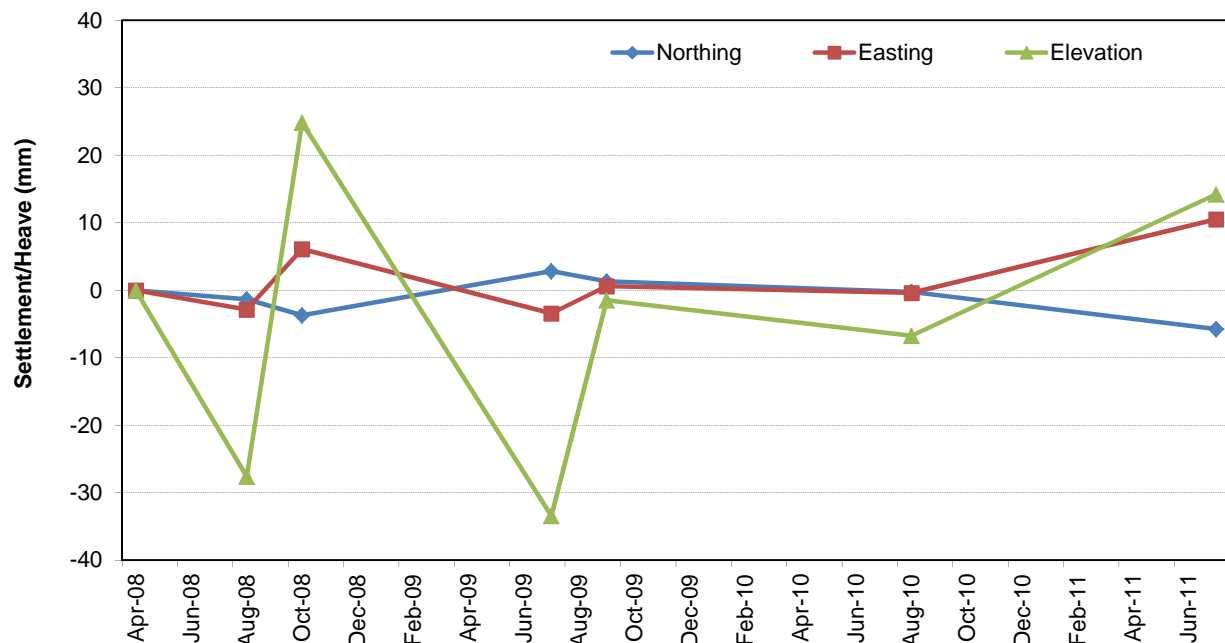


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #5

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	5A	146	6	15	91	38	18	17.511	1.593	5337.355	1307.654	80.896			
8-Aug-08	5A	146	5	19	91	29	20	17.506	1.519	5337.354	1307.648	80.868	-0.001	-0.006	-0.028
18-Oct-08	5A	146	7	20	91	55	18	17.515	1.674	5337.353	1307.660	80.891	0.000	0.011	0.023
25-Jul-09	5A	146	6	28	91	53	1	17.513	1.633	5337.354	1307.655	80.861	0.001	-0.005	-0.029
19-Sep-09	5A	146	6	54	91	53	58	17.518	1.635	5337.357	1307.659	80.858	0.003	0.004	-0.003
2-Aug-10	5A	146	6	43	91	29	39	17.515	1.506	5337.358	1307.659	80.853	0.001	-0.001	-0.005
03-Jul-11	5A	146	12	6	91	8	9	17.515	1.416	5337.347	1307.684	80.873	-0.011	0.025	0.020
22-Apr-08	5B	92	56	58	91	53	35	17.712	1.632	5337.490	1310.713	81.075			
8-Aug-08	5B	92	56	21	91	20	1	17.706	1.436	5337.487	1310.710	81.052	-0.002	-0.003	-0.023
18-Oct-08	5B	92	56	43	91	50	16	17.704	1.610	5337.482	1310.714	81.070	-0.005	0.004	0.018
25-Jul-09	5B	92	56	27	91	55	26	17.709	1.610	5337.486	1310.711	81.043	0.004	-0.003	-0.027
19-Sep-09	5B	92	56	12	91	58	29	17.712	1.626	5337.488	1310.709	81.044	0.002	-0.002	0.000
2-Aug-10	5B	92	55	46	91	32	51	17.705	1.484	5337.484	1310.708	81.034	-0.003	-0.001	-0.010
03-Jul-11	5B	92	56	9	91	5	10	17.698	1.350	5337.481	1310.711	81.043	-0.003	0.003	0.009
22-Apr-08	5F	286	10	48	91	45	54	12.624	1.635	5341.035	1307.826	81.089			
8-Aug-08	5F	286	10	54	91	38	10	12.624	1.575	5341.034	1307.826	81.058	-0.001	0.000	-0.032
18-Oct-08	5F	286	10	54	91	45	51	12.631	1.637	5341.029	1307.830	81.091	-0.005	0.003	0.034
25-Jul-09	5F	286	11	1	91	28	48	12.624	1.530	5341.033	1307.826	81.047	0.004	-0.003	-0.044
19-Sep-09	5F	286	11	17	91	57	1	12.628	1.632	5341.032	1307.826	81.045	-0.001	0.000	-0.002
2-Aug-10	5F	286	10	55	91	32	5	12.624	1.535	5341.033	1307.827	81.040	0.002	0.001	-0.005
03-Jul-11	5F	286	10	40	91	25	23	12.628	1.525	5341.030	1307.830	81.054	-0.003	0.003	0.014

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	-1.3	-2.8	-27.6
	18-Oct-08	-3.7	6.1	24.8
	25-Jul-09	2.8	-3.4	-33.4
	19-Sep-09	1.3	0.6	-1.5
	2-Aug-10	-0.2	-0.4	-6.7
OVERALL PERIOD AVERAGE (mm)		-1.2	1.8	-5.0

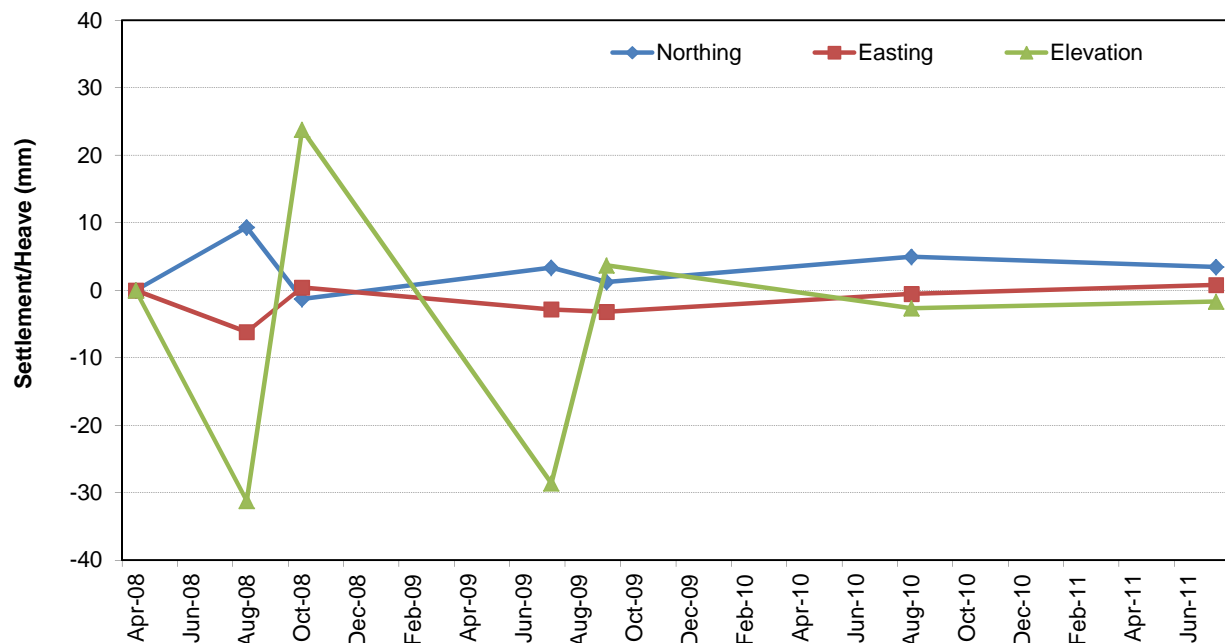


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #6

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	6C	86	44	44	92	19	47	18.155	1.669	5337.092	1317.422	80.991			
8-Aug-08	6C	86	44	29	91	47	9	18.157	1.471	5337.099	1317.418	80.965	0.007	-0.004	-0.026
18-Oct-08	6C	86	45	2	92	11	48	18.167	1.625	5337.105	1317.418	80.989	0.006	0.001	0.024
25-Jul-09	6C	86	44	30	92	9	45	18.167	1.592	5337.105	1317.416	80.966	-0.001	-0.003	-0.022
19-Sep-09	6C	86	44	18	92	14	48	18.171	1.622	5337.107	1317.413	80.970	0.002	-0.002	0.003
2-Aug-10	6C	86	44	17	91	58	6	18.169	1.532	5337.108	1317.413	80.968	0.001	-0.001	-0.002
03-Jul-11	6C	86	44	26	91	31	27	18.166	1.380	5337.110	1317.413	80.957	0.001	0.000	-0.011
22-Apr-08	6D	301	21	11	91	39	4	12.434	1.669	5340.813	1317.436	81.031			
8-Aug-08	6D	301	23	36	91	11	17	12.430	1.544	5340.819	1317.429	81.006	0.006	-0.007	-0.024
18-Oct-08	6D	301	23	7	91	27	28	12.434	1.623	5340.816	1317.430	81.027	-0.003	0.000	0.020
25-Jul-09	6D	301	24	12	91	18	28	12.434	1.555	5340.818	1317.426	80.991	0.001	-0.004	-0.035
19-Sep-09	6D	301	26	5	91	8	24	12.438	1.527	5340.817	1317.417	81.000	0.000	-0.008	0.008
20-Aug-10	6D	301	27	8	91	4	52	12.440	1.510	5340.818	1317.413	80.995	0.000	-0.004	-0.004
03-Jul-11	6D	301	27	19	90	23	4	12.436	1.360	5340.820	1317.414	80.997	0.002	0.001	0.001
22-Apr-08	6E	294	8	42	92	4	22	12.560	1.670	5340.311	1314.183	81.061			
8-Aug-08	6E	294	9	24	91	52	33	12.542	1.583	5340.325	1314.175	81.017	0.015	-0.008	-0.043
18-Oct-08	6E	294	9	53	92	3	19	12.550	1.650	5340.318	1314.176	81.045	-0.007	0.000	0.027
25-Jul-09	6E	294	9	35	91	50	52	12.539	1.576	5340.328	1314.174	81.017	0.009	-0.002	-0.028
19-Sep-09	6E	294	9	13	92	0	36	12.539	1.611	5340.329	1314.174	81.016	0.002	0.001	0.000
2-Aug-10	6E	294	8	34	91	48	31	12.529	1.563	5340.338	1314.174	81.013	0.009	-0.001	-0.004
03-Jul-11	6E	294	7	33	91	28	51	12.521	1.496	5340.345	1314.176	81.017	0.007	0.002	0.005

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	9.3	-6.2	-31.2
	18-Oct-08	-1.3	0.4	23.8
	25-Jul-09	3.4	-2.8	-28.6
	19-Sep-09	1.2	-3.2	3.7
	2-Aug-10	5.0	-0.5	-2.7
OVERALL PERIOD AVERAGE (mm)		3.5	-1.9	-6.1

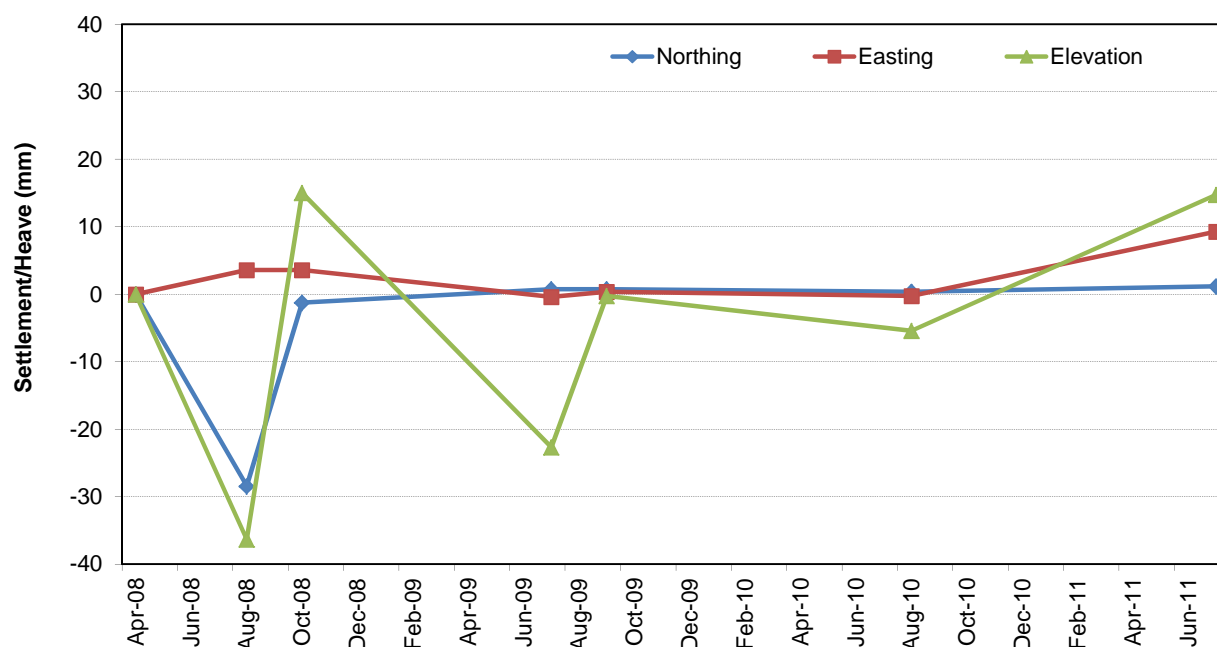


Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #7

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	7A	139	42	34	91	19	5	22.702	1.593	5343.001	1307.814	80.875			
8-Aug-08	7A	139	41	54	91	13	37	22.699	1.519	5343.000	1307.809	80.837	0.000	-0.005	-0.038
18-Oct-08	7A	139	42	48	91	35	4	22.706	1.674	5343.001	1307.816	80.850	0.001	0.007	0.013
25-Jul-09	7A	139	42	40	91	31	45	22.705	1.633	5343.001	1307.815	80.831	0.000	-0.001	-0.019
19-Sep-09	7A	139	43	2	91	32	18	22.708	1.635	5343.003	1307.818	80.829	0.002	0.003	-0.002
2-Aug-10	7A	139	42	56	91	13	10	22.706	1.506	5343.004	1307.818	80.827	0.001	0.000	-0.003
03-Jul-11	7A	139	46	55	90	56	11	22.709	1.416	5342.999	1307.845	80.849	-0.005	0.026	0.022
22-Apr-08	7B	97	41	28	91	36	36	23.321	1.632	5343.343	1310.862	81.005			
8-Aug-08	7B	97	41	3	91	12	7	23.230	1.436	5343.258	1310.879	80.977	-0.085	0.017	-0.028
18-Oct-08	7B	97	41	12	91	36	11	23.232	1.610	5343.256	1310.881	80.988	-0.002	0.001	0.011
25-Jul-09	7B	97	41	14	91	39	3	23.232	1.610	5343.256	1310.881	80.969	0.000	0.000	-0.019
19-Sep-09	7B	97	41	3	91	41	23	23.234	1.626	5343.257	1310.879	80.969	0.001	-0.002	0.000
2-Aug-10	7B	97	40	48	91	21	28	23.229	1.484	5343.255	1310.878	80.962	-0.002	-0.001	-0.007
03-Jul-11	7B	97	41	8	91	0	2	23.228	1.350	5343.258	1310.880	80.972	0.002	0.002	0.011
22-Apr-08	7F	267	27	43	92	53	46	8.278	1.635	5346.505	1307.626	81.060			
8-Aug-08	7F	267	27	54	92	46	47	8.276	1.575	5346.505	1307.624	81.017	0.000	-0.001	-0.043
18-Oct-08	7F	267	28	14	93	3	56	8.282	1.637	5346.502	1307.627	81.037	-0.003	0.002	0.020
25-Jul-09	7F	267	27	32	92	31	52	8.276	1.530	5346.505	1307.626	81.008	0.003	-0.001	-0.030
19-Sep-09	7F	267	27	57	93	13	50	8.281	1.632	5346.504	1307.626	81.008	-0.001	-0.001	0.001
2-Aug-10	7F	267	27	12	92	36	15	8.276	1.535	5346.506	1307.626	81.002	0.002	0.001	-0.006
03-Jul-11	7F	267	25	19	92	27	30	8.271	1.525	5346.512	1307.626	81.013	0.006	0.000	0.011

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	-28.4	3.6	-36.3
	18-Oct-08	-1.3	3.6	15.0
	25-Jul-09	0.7	-0.4	-22.7
	19-Sep-09	0.8	0.4	-0.2
	2-Aug-10	0.4	-0.2	-5.4
3-Jul-11		1.2	9.3	14.7
OVERALL PERIOD AVERAGE (mm)		-4.4	2.7	-5.8



Boston Primary Fuel Tank Farm Settlement Monitoring

Tank #8

Date	Tank Mark	Horizontal Angle			Vertical Angle			Slope Dist.	HI [m]	Northing [m]	Easting [m]	Elevation [m]	Difference from Previous Survey [m]		
		Deg	Min	Sec	Deg	Min	Sec						N	E	EI
22-Apr-08	8C	91	52	15	91	53	25	23.449	1.669	5342.700	1317.450	80.956			
8-Aug-08	8C	91	52	27	91	27	51	23.453	1.471	5342.709	1317.449	80.932	0.009	-0.001	-0.024
18-Oct-08	8C	91	52	47	91	44	54	23.460	1.625	5342.713	1317.450	80.969	0.004	0.001	0.038
25-Jul-09	8C	91	52	11	91	44	54	23.460	1.592	5342.712	1317.446	80.936	-0.001	-0.004	-0.033
19-Sep-09	8C	91	52	1	91	49	2	23.464	1.622	5342.715	1317.444	80.938	0.003	-0.002	0.002
2-Aug-10	8C	91	51	51	91	36	4	23.462	1.532	5342.715	1317.443	80.936	0.000	-0.001	-0.001
03-Jul-11	8C	91	51	39	91	15	5	23.465	1.380	5342.721	1317.439	80.928	0.006	-0.003	-0.009
22-Apr-08	8D	318	8	27	92	56	10	8.342	1.669	5345.860	1317.826	80.962			
8-Aug-08	8D	318	11	46	92	12	54	8.340	1.544	5345.864	1317.819	80.942	0.004	-0.007	-0.020
18-Oct-08	8D	318	11	50	92	33	48	8.341	1.623	5345.865	1317.820	80.970	0.001	0.001	0.028
25-Jul-09	8D	318	12	39	92	22	34	8.342	1.555	5345.865	1317.817	80.929	0.000	-0.003	-0.041
19-Sep-09	8D	318	14	50	92	8	19	8.347	1.527	5345.865	1317.808	80.936	0.000	-0.008	0.006
2-Aug-10	8D	318	15	55	92	2	57	8.350	1.510	5345.865	1317.804	80.931	0.000	-0.004	-0.004
03-Jul-11	8D	318	18	11	91	1	8	8.342	1.360	5345.872	1317.804	80.932	0.007	-0.001	0.000
22-Apr-08	8E	282	47	41	93	37	20	7.635	1.670	5345.604	1313.962	81.033			
8-Aug-08	8E	282	46	58	93	16	40	7.615	1.583	5345.619	1313.954	80.993	0.016	-0.007	-0.040
18-Oct-08	8E	282	47	20	93	29	56	7.621	1.650	5345.615	1313.956	81.030	-0.004	0.001	0.037
25-Jul-09	8E	282	46	37	93	12	50	7.612	1.576	5345.622	1313.954	80.994	0.007	-0.002	-0.036
19-Sep-09	8E	282	46	11	93	29	15	7.613	1.611	5345.623	1313.954	80.993	0.001	0.000	-0.001
2-Aug-10	8E	282	44	37	93	10	6	7.603	1.563	5345.632	1313.953	80.988	0.008	-0.001	-0.005
03-Jul-11	8E	282	42	57	92	39	13	7.591	1.496	5345.641	1313.952	80.990	0.009	-0.001	0.002

TANK AVERAGES BY DATE (mm)	22-Apr-08	0.0	0.0	0.0
	8-Aug-08	9.7	-5.3	-28.0
	18-Oct-08	0.3	1.1	34.4
	25-Jul-09	1.9	-3.0	-36.5
	19-Sep-09	1.3	-3.3	2.2
	2-Aug-10	2.8	-2.1	-3.6
	3-Jul-11	7.3	-1.6	-2.3
OVERALL PERIOD AVERAGE (mm)		3.9	-2.4	-5.6

