

APPENDIX 7.III

Groundwater Quality

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ATTACHMENTS

Appendix 7.III

Groundwater Quality

Attachment 7.III.I

Borehole Logs

Attachment 7.III.II

Detailed Results – Groundwater Quality

Attachment 7.III.III

Quality Control – Groundwater Quality

7.III.1 INTRODUCTION

An evaluation of groundwater quality was performed as part of the water quality assessment for the NICO Project. The groundwater quality monitoring program is one component of the comprehensive environmental and socio-economic baseline program that was been undertaken in support of the NICO Project. The results of groundwater quality monitoring were used to supplement the water quality predictions for the NICO Project.

Several groundwater monitoring locations have been established at the NICO Project, including groundwater piezometers, groundwater seeps, and existing boreholes that are flowing under artesian conditions (Figure 7.III.1-1). Groundwater quality samples were collected during several sampling campaigns in 2004, 2009, and 2011 to assess the composition of background water quality at the NICO Project site. Select groundwater monitoring locations established during the baseline program will continue to be monitored during operations and closure.

This appendix provides a factual summary of the results of groundwater quality monitoring at the NICO Project site in 2004, 2009, 2010, and 2011.

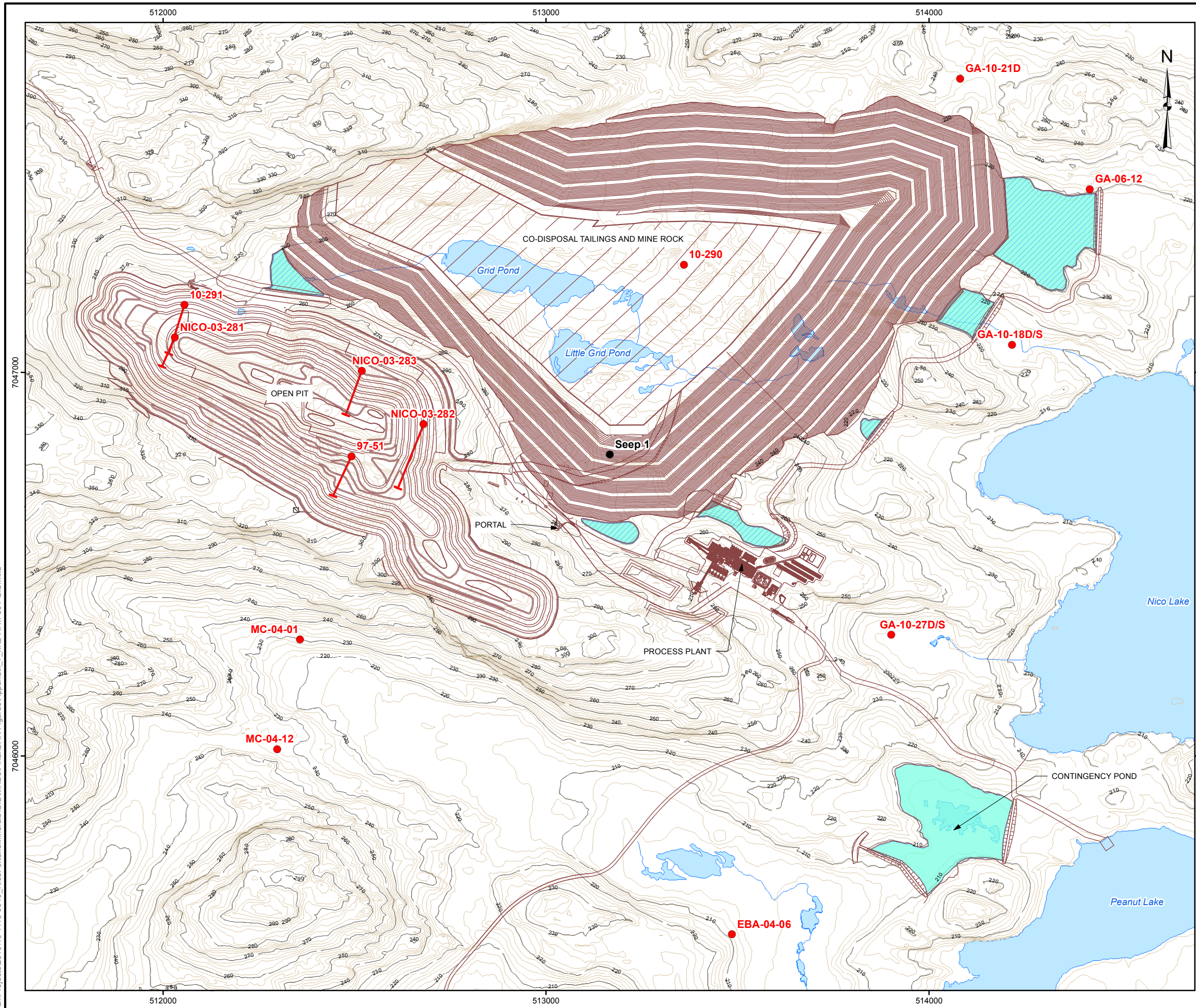
7.III.2 GROUNDWATER MONITORING LOCATIONS

Figure 7.III.1-1 presents the location of the baseline groundwater monitoring locations, relative to the proposed site infrastructure. Groundwater monitoring locations in the baseline dataset include:

- **Groundwater piezometers:** groundwater monitoring wells installed for the purpose of groundwater quality monitoring and hydrogeological evaluation. Detailed information specific to the groundwater piezometers is provided in Attachment 7.III.1-1.
- **Westbay piezometers:** permanent monitoring points installed in a single borehole for the purpose of evaluating the chemical composition of deep groundwater, and the changes in groundwater chemistry with depth. Detailed information specific to the groundwater piezometers is provided in Attachment 7.III.1-2.
- **Artesian flow:** existing drill hole at the NICO Project site from which groundwater was freely flowing under artesian conditions until a cap was installed.
- **Seepage:** monitoring point located at a location where water collects in the middle of a road. This point could represent groundwater seepage, or local runoff.

Table 7.III.2-1 provides a comprehensive summary of the location and objective of each groundwater monitoring point. Groundwater monitoring locations are discussed by location relative to the proposed site infrastructure, and the lithology (i.e., type of rock) that the groundwater monitoring location occurs within. The location of each monitoring point has relevance with respect to the baseline composition of groundwater and potential effects of groundwater on site water quality. The composition of rock in contact with groundwater at each location can influence groundwater composition; thus, lithology is an important consideration in the evaluation of baseline groundwater chemistry.

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LEGEND

- SEEP LOCATION
- GROUNDWATER MONITORING POINT
- HORIZONTAL TRACE
- PROPOSED NICO MINE SITE
- CONTOUR - 10 m INTERVAL
- CONTOUR - 2m INTERVAL
- WATERCOURSE
- WATERBODY
- SEEPAGE COLLECTION/SURGE POND
- CONTINGENCY POND

NOTES

1. D = Deep Monitoring point
2. S = Shallow Monitoring point

REFERENCE

Topographic mapping obtained from Eagle Mapping, Fortune Minerals Limited, 2006 (File: Basemapping FML, 20060718).dwg)

Open Pit Configuration - Provided by P & E Mining Consultants Inc. (File: End_of_year2031.dxf Received August 26, 2010)

Advanced Exploration Infrastructure - Provided by Aker Solutions (File: 0000g001D.dwg Received October 25, 2010)

Projection: UTM Zone11 Datum: NAD 83

100 0 500
SCALE 1:10,000 METRES

				FORTUNE MINERALS LIMITED			
				NICO DEVELOPER'S ASSESSMENT REPORT			
TITLE							
GROUNDWATER MONITORING POINTS							
FILE No. E-A7III-001-GIS							
PROJECT NO. 09-1373-1004		SCALE AS SHOWN		REV. 0			
DESIGN	SC	16 Feb. 2011					FIGURE: 7.III.1-1
GIS	SC	17 May. 2011					
CHECK	KS	17 May. 2011					
REVIEW	MR	17 May. 2011					



Edmonton, Alberta

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Table 7.III.2-1: Objective of Groundwater Monitoring Locations in Baseline Groundwater Quality Dataset

Type of Monitoring Location	Objective of Monitoring Location	Groundwater Monitoring Location	Depth of Screened Interval		Screened Rock Unit
			From (m bgs)	To (m bgs)	
Groundwater piezometers	Piezometers were installed within the ore zone to evaluate the baseline chemical composition of deep groundwater in contact with mineralized rock. These monitoring points are located within the perimeter of the Open Pit.	03-283	57.9	94.5	Interbedded meta-Greywacke and Schists (Upper Ore Zone)
		03-282	140.2	182.9	Potassium Feldspar Dyke 140.2 to 151.8 m Interbedded meta-Greywacke and Schist (ore zone) 151.8 to 182.8 m (Dyke and Waste Rock)
		03-281	91.4	117	Interbedded meta-Greywacke and Schists overlying footwall Siltstone (Lower Ore Zone and footwall rock)
Westbay piezometer	A Westbay piezometer with 3 sample collection ports was installed within the perimeter of the Open Pit to evaluate changes in the chemical composition of groundwater with depth, for the purpose of evaluating the potential for upwelling of saline groundwater during mining.	10-291-86	85	94.7	Sub-arkosic wacke interbedded with biotite-magnetite schist
		10-291-116	115.2	124.9	Biotite-magnetite-amphibole schist
		10-291-160	160.6	169.7	Mineralized, foliated biotite-magnetite-amphibole schist
Groundwater piezometer	Groundwater collected from a piezometer installed in an inclined exploration drill hole drilled on from the hill top towards the footwall. Water at this location represents the water table of the decline. Water quality at this location could reflect the composition of the flooded exploration ramp away from the portal.	97-051	~ 125 m		Groundwater could represent water from the flooded exploration ramp. Depth of piezometer coincides with a zone of mineralized quartz-feldspar porphyry.

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Table 7.III.2-1: Objective of Groundwater Monitoring Locations in Baseline Groundwater Quality Dataset (continued)

Type of Monitoring Location	Objective of Monitoring Location	Groundwater Monitoring Location	Depth of Screened Interval		Screened Rock Unit
			From (m bgs)	To (m bgs)	
Groundwater piezometers	Groundwater piezometers installed to evaluate the baseline composition of groundwater southwest of the Open Pit.	MC-04-01	0.7	10	Metamorphosed Siltstone (Bedrock) - Top 3 m in Quartz and Feldspar Porphyry (bedrock)
		MC-04-12	1	12.5	Metamorphosed Siltstone (Bedrock) - Top 1.5 m in Boulders - Bottom 3.2 m in Rhyolite (Dyke)
Groundwater piezometer	Groundwater piezometer installed to evaluate the baseline composition of groundwater in the flow path between the plant site and NICO Lake.	EBA-04-06	3	15	Metamorphosed Siltstone (Bedrock) - Top 1.3 m in Boulders, Cobbles and Gravel - matrix washed away during drilling
Groundwater piezometer	Groundwater piezometers installed to evaluate the baseline composition of groundwater at monitoring locations between the Co-Disposal Facility and Nico Lake.	GA-06-12	7.6	15	Rhyolite (Bedrock)
		GA-10-18D	5.9	10.2	Cordierite schist
		GA-10-18S	0.3	3.7	Overburden
		GA-10-21D	15.7	19.7	Lapilli Tuff
		GA-10-27D	15.2	18.3	Sub-arkosic arenite and quartz-feldspar porphyry
		GA-10-27S	1.4	2.9	Overburden
Artesian flow	Groundwater collected from an artesian flow emanating from an exploration drill hole located within the footprint of the Open Pit.	10-290	Artesian flow		Artesian hole, casing burned in and capped with ball valve.
Seepage	Water collected from the middle of a road location 250 m south of Little Grid Pond. This station has been named "SEEP1", but could represent a natural spring, local runoff, or a wetland to the south of the seep below the settling pond.	SEEP1	Seepage		Seepage from a bedrock outcrop, or local runoff.

m bgs = meters below ground surface; m = metre

7.III.3 GROUNDWATER QUALITY EVALUATION

7.III.3.1 Methods

7.III.3.1.1 Sample Collection

Samples were collected from piezometers installed at the NICO Project during several sample campaigns that took place in 2004, 2007, 2009, and 2010. Golder and Fortune collected samples in 2004. Fortune oversaw the all groundwater quality sample collection campaigns that took place after 2009.

Piezometers at 03-281, 03-282, and 03-283 were purged using pressurized nitrogen during both sample campaigns. Pressurized nitrogen cylinders were transported to the sample locations. High pressure tubing was connected to the cylinders, and lowered into the well to close to the top of the screened zone (03-281 and 03-283). The tubing was lowered as far as possible into 03-282. The pressurized nitrogen was injected into the piezometers, emptying the volume of standing water from the stand pipe. The nitrogen was turned off and the well was allowed to recover. The water level was allowed to return to static levels. The process was repeated several times over a period of a few days prior to sample collection. After the water quality samples were collected, the nitrogen cylinders were disconnected, but the high pressure tubing was secured in the piezometers for use during future sample campaigns. Similarly, water was collected from a piezometer installed in a former exploration drill hole (97-051) by purging the open drill hole with nitrogen, using the same method as for 03-281, 03-282, and 03-283.

Fortune collected the samples from the Westbay monitoring wells following well installation. According to Fortune, the sample ports were purged several times prior to sample collection. Samples have not been collected since the date of well installation owing to issues that occurred during the installation of the Westbay monitoring ports. According to Fortune, the lowest monitoring port is no longer accessible. The upper 2 monitoring ports are still available for sample collection, and will be sampled routinely as part of future groundwater monitoring campaigns.

Samples were collected from GA-10-18, GA-10-21, GA-10-27, MC-04-01, MC-04-12, GA-06-12, and EBA-04-06 using dedicated Waterra tubing and foot valves. At least 3 volumes of water equivalent to the volume of the screened interval were purged from each piezometer prior to sample collection. The Waterra tubing was drained (to prevent freezing) and left in place for use during future sample campaigns.

Samples were collected from 10-290 by lowering a sample bottle into the water flowing from the drill hole following drilling. Similarly, the seep water quality samples collected from SEEP1 were collected by placing a bottle in the path of flow.

7.III.3.1.2 Field Measurements and Sample Preservation

Field parameters, including temperature, pH, and conductivity, were measured prior to sample collection. Table 7.III.3-1 provides an overview of field measurements taken during sample collection in 2004 and 2009. Fortune did not collect field measurements in 2007 or 2010.

Samples were collected in bottles provided by the analytical laboratory. Samples were preserved in the field for all parameters except dissolved metals. The dissolved metals aliquot of each sample was filtered and preserved at the analytical laboratory.

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Table 7.III.3-1: Field Measurements of Select Parameters in Groundwater, August 2009

Hole ID	Date	pH	Dissolved Oxygen	Redox	Temperature	Conductivity
		s.u.	mg/L	mV	°C	uS/cm
03-281	10-Jul-04	9.26	2.2	152	2.7	
03-282	10-Jul-04	11.6	1.4	149	7.6	
03-283	10-Jul-04	9.8	1.4	141	6.6	
03-282 (D)	10-Jul-04	11.8	1.9	110	7.4	
03-281	30-Aug-09	10.4				603
03-282	31-Aug-09	10.3			5.4	224
03-283	30-Aug-09	8.3				399
MC-04-01	29-Aug-09	7.1			8.3	245
MC-04-12	28-Aug-09	6.8			5.5	92
GA-06-12	29-Aug-09	7.6			6.0	245
EBA-04-06	28-Aug-09	7.6			3.9	295

Jul = July; Aug = August; s.u. = standard units; mg/L = milligram per Litre; mV = millivolts; °C = degrees Celsius; µS/cm = microseonds per centimetre

7.III.3.1.3 Laboratory Analysis

Groundwater samples were submitted to ALS Canada Inc. in Edmonton, Alberta for the following analyses:

- general parameters, including pH, conductivity, alkalinity (total, bicarbonate, and carbonate), hardness, and total dissolved solids;
- anions and nutrients, including chloride, sulphate, fluoride, phosphorus, ammonia, nitrate, and nitrite; and
- total (2004, 2007, 2009, 2010 and 2011) and dissolved (2007, 2009, 2010 and 2011) metals, including Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Se, Si, Ag, Na, Sr, S, Sn, Ti, Tl, V, and Zn.

Total and dissolved metals were analyzed by both ICP-OES and ICP-MS. ICP-OES is the standard analytical method used to analyze water quality samples for total and dissolved metals. Samples collected in 2007, 2009, 2010, and 2011 underwent low-level analysis by ICP-MS; ICP-MS is capable of achieving lower analytical detection limits than ICP-OES.

7.III.3.1.4 Data Analysis

Trends in water quality monitoring data were evaluated using 2 approaches:

- 1) Evaluation of concentrations of select parameters relative to the site-specific water quality objectives for the NICO Project; and
- 2) Piper trilinear diagrams.

The results of groundwater sample analysis were compared to the site-specific water quality objectives for the NICO Project in Attachment 7.III.II. The purpose of this evaluation is to qualitatively identify parameters with concentrations that exceed the site-specific water quality objectives in baseline conditions. Where possible, trends in water quality were qualitatively evaluated with respect to the depth of the groundwater sample and the

rock type in contact with the groundwater monitoring location for the purpose of identifying factors that may influence the baseline groundwater characteristics.

Piper trilinear diagrams ("Piper diagrams") were used to characterize the major ion composition of waters collected from groundwater monitoring locations. Piper diagrams are a common method for interpreting trends in water chemistry, and are used to visually interpret chemical composition trends for major ions. The results of water quality analysis are plotted on 2 trilinear diagrams: one diagram assesses the relative ratio of the major cations (i.e., calcium [Ca], magnesium [Mg], and sodium + potassium [Na+K] in a sample), and the second diagram assesses the relative ratio of the major anions (i.e., chloride [Cl], sulphate [SO₄], and carbonate [CO₃+HCO₃]). The relative cation and anion composition of the sample is then projected onto the rhombohedral portion of the diagram, which is used to further identify trends in major ion composition that may not otherwise be evident.

7.III.3.2 Results

This section discusses the results of groundwater quality data analysis by general location relative to the proposed site infrastructure, as described in Table 7.III.2-1. Attachment 7.III.II provides the detailed results of analysis of groundwater samples in the baseline groundwater quality dataset. Tables 7.III.3-2a through 7.III.3-2e presents a summary of the baseline groundwater quality dataset for the NICO Project.

7.III.3.3 Groundwater Piezometers Located Within the Perimeter of the Open Pit: 03-281, 03-282, and 03-282

Groundwater samples were collected from 3 piezometers located within the perimeter of the proposed Open Pit. Groundwater samples collected from piezometers 03-281, 03-282, and 03-283 represent groundwater in contact with mineralized rock in the ore zone. The objective of these monitoring locations is to evaluate the baseline composition of groundwater in contact with mineralized rock that may be collected in groundwater seeps to the Open Pit during mining.

Detailed results of groundwater quality analysis are provided in Attachments 7.III.II-1, 7.III.II-2, and 7.III.II-3. The composition of groundwater samples collected from 03-281, 03-282, and 03-283 is summarized in Table 7.III.3-2a. The following points highlight some of the results.

- Groundwater pH varied from 8.11 to 11.8. The pH range of groundwater sampled from the ore zone is within the upper end of the typical composition of deep, anoxic groundwater (Langmuir 1997). The elevated pH measured in some groundwater samples in 2004 indicates that the wells could be influenced by the presence of cement grout that was used to install the wells.
- The Eh of groundwater in 2004 varied from 110 to 152 millivolts (mV) (Table 7.III.4-1).
- Total dissolved solids concentrations ranged from 87 to 324 milligrams per litre (mg/L).
- The major ion composition of groundwater from the ore zone was similar in samples collected from 03-282, 03-281 and 03-283. Groundwater from the ore zone had a HCO₃-Mg-Ca-SO₄ to HCO₃-Ca-Na-SO₄ type composition (Figure 7.III.3-1). Water from each ore zone had a unique major ion composition: water from the 03-282 (middle ore zone) and 03-281 (lower ore zone) was more sulphate-rich than water from 03-282 (upper ore zone).
- Dissolved concentrations of arsenic (0.0363 to 0.92 mg/L), cobalt (0.0011 to 0.00617 mg/L), and uranium (0.00087 to 0.0598 mg/L) were elevated with respect to the site-specific water quality objectives.

Table 7.III.3-2a

Summary of Results of Water Quality Monitoring from Monitoring Wells within the Open Pit - 03-281, 03-282 and 03-283

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-283 ^a			03-282 ^b			03-281 ^c		
			Number of Samples	Minimum - 03-283	Maximum - 03-283	Number of Samples	Minimum - 03-282	Maximum - 03-282	Number of Samples	Minimum - 03-281	Maximum - 03-281
GENERAL PARAMETERS											
pH	pH units		6	8.11	9.4	9	8.57	11.1	7	8.15	10.07
Conductivity	uS/cm		6	222	385	9	180	500	7	239	500
Alkalinity	mg/L as CaCO3		6	51	99.7	9	31.8	150	7	84	150
Hardness ²	mg/L as CaCO3		6	54	194	9	38.8	102	7	35.8	120
Bicarbonate (HCO3)	mg/L		6	36	122	9	16	128	7	53	128
Carbonate (CO3)	mg/L		6	13	13	9	5	51.9	7	5	51.9
Total Dissolved Solids (TDS)	mg/L		6	123	239	9	87	315	7	133	324
ANIONS & NUTRIENTS											
Chloride (Cl)	mg/L	353	6	0.5	5	9	0.53	2	7	0.5	2
Sulphate (SO ₄)	mg/L	500	6	36.6	100	9	35.2	114	7	32.1	114
DISSOLVED METALS (ICP-MS)											
Aluminum (Al)	mg/L	0.16	5	0.0074	0.0887	7	0.0062	0.185	6	0.0573	0.2
Antimony (Sb)	mg/L	0.03	5	0.00232	0.00927	7	0.00059	0.00251	6	0.00237	0.00346
Arsenic (As)	mg/L	0.05	5	0.138	0.197	7	0.0363	0.41	6	0.321	0.92
Cadmium (Cd)	mg/L	0.00015	5	0.00005	<0.01	7	0.000012	0.000259	6	0.000012	0.00018
Cobalt (Co)	mg/L	0.004	5	0.0023	0.00617	7	0.00011	0.00035	6	0.00035	<0.01
Copper (Cu)	mg/L	0.022	5	0.00282	0.015	7	0.00167	0.00461	6	0.0017	0.00864
Lead (Pb)	mg/L	0.001	5	<0.0001	<0.05	7	<0.0001	<0.05	6	<0.0001	<0.05
Molybdenum (Mo)	mg/L	0.073	5	0.0126	0.037	7	0.0315	0.054	6	0.00435	0.0378
Selenium (Se)	mg/L	0.0035	5	0.00081	0.00081	7	0.0004	<0.2	6	0.0004	0.00063
Uranium (U)	mg/L	0.027	5	0.0166	0.0598	7	0.00087	0.0263	6	0.00145	0.00463
Zinc (Zn)	mg/L	0.11	5	0.0021	0.0027	7	0.0013	0.0079	6	0.0016	0.0064

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

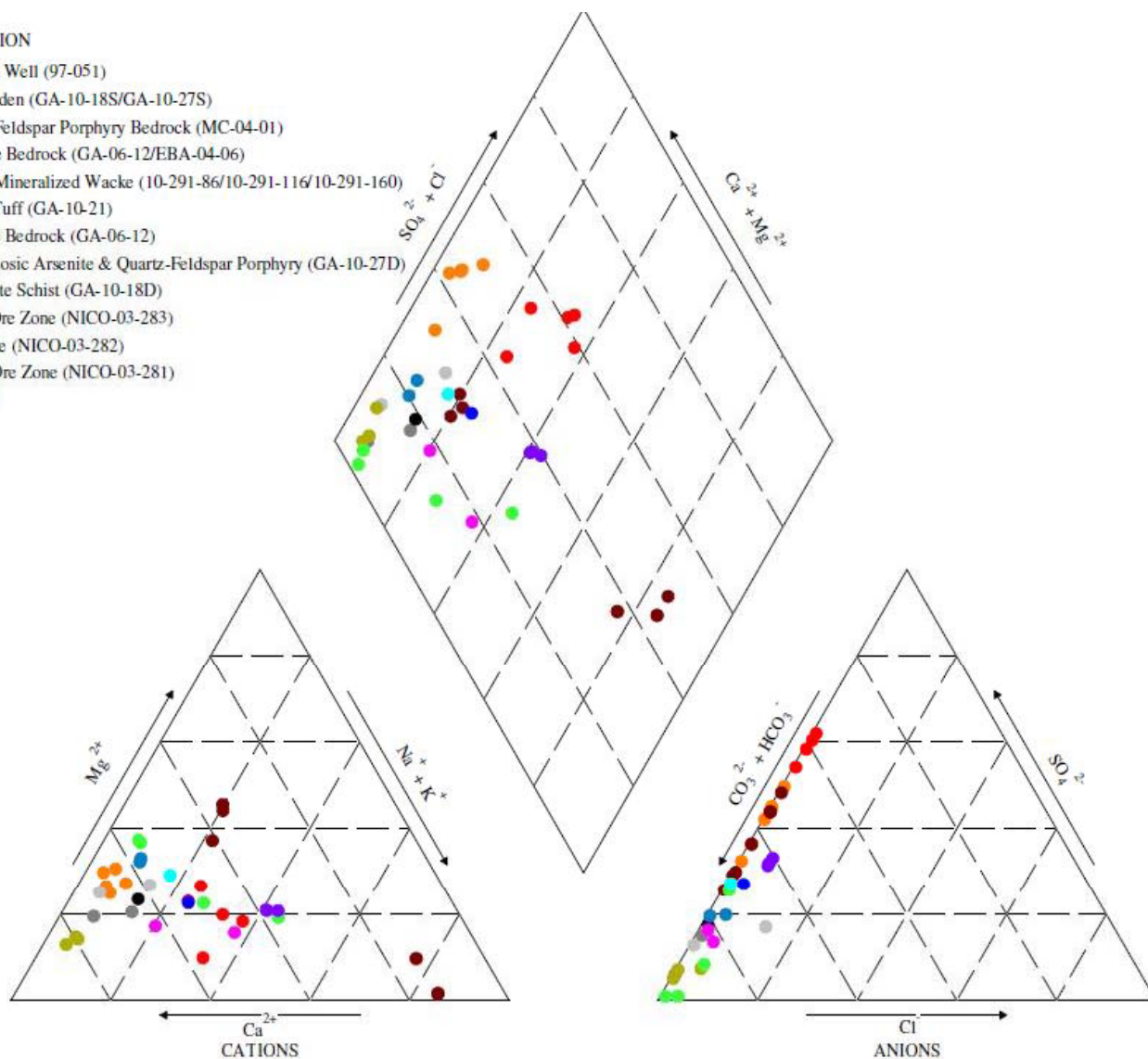
a. Range represents results of analysis of samples collected from 03-283 on July 10, 2004; August 30, 2009; April 6, 2010; June 14, 2010; July 20, 2010; and August 16, 2010.

b. Range represents results of analysis of samples collected from 03-282 on July 10, 2004 (duplicate); August 30, 2009 (duplicate); April 6, 2010 (duplicate); June 14, 2010; July 20, 2010; and August 16, 2010.

c. Range represents results of analysis of samples collected from 03-281 on July 10, 2004; August 30, 2009 (duplicate); April 6, 2010; June 14, 2010; July 20, 2010; and August 16, 2010.

EXPLANATION

- Artesian Well (97-051)
- Overburden (GA-10-18S/GA-10-27S)
- Quartz-Feldspar Porphyry Bedrock (MC-04-01)
- Siltstone Bedrock (GA-06-12/EBA-04-06)
- Wacke/Mineralized Wacke (10-291-86/10-291-116/10-291-160)
- Lapilli Tuff (GA-10-21)
- Rhyolite Bedrock (GA-06-12)
- Sub-Arkosic Arsenite & Quartz-Feldspar Porphyry (GA-10-27D)
- Cordierite Schist (GA-10-18D)
- Upper Ore Zone (NICO-03-283)
- Ore Zone (NICO-03-282)
- Lower Ore Zone (NICO-03-281)
- SEEP-1



Note: Diagram plotted using dissolved concentrations where available.

Title

Trilinear Diagram – Major Ion Composition of
Groundwater Samples Collected from the NICO
Project



Date: 4-11-09

Drawn: MD

Check: KAS

Figure 7.III.3-1

7.III.3.4 Westbay Monitoring Well Located Within the Perimeter of the Open Pit: 10-291

The Westbay monitoring well was installed within the perimeter of the Open Pit to evaluate the variability in groundwater composition with depth. The objective of this evaluation was to identify trends in groundwater composition that could indicate a potential for saline upwelling into the open pit and underground mine workings. Similar to monitoring locations 03-283, 03-282, and 03-281, the Westbay monitoring ports are located in mineralized rock. Groundwater samples collected from the Westbay monitoring ports represent groundwater in contact with mineralized rock. Detailed results of water quality analysis are provided in Attachment 7.III.II-4. The composition of water quality samples collected from 10-291 is summarized in Table 7.III.3-2b.

Samples were only collected from 10-291 once in 2010, owing to issues with the installation of the monitoring points. Thus, long-term trends in the chemical composition of water from 10-291 (including trends in composition with depth) are not available. The results of analysis from 10-291 are presented for the purpose of qualitative discussion of the chemical composition of groundwater collected from a location within the perimeter of the Open Pit. The following points highlight some of the results.

- Groundwater pH varied from 8.17 to 8.31. The pH range of samples collected from 10-291 falls within a typical groundwater range (Langmuir 1997). The pH of water collected from 10-291 is similar to other groundwater piezometers that are located within the perimeter of the Open Pit.
- Total dissolved solids concentrations ranged from 191 to 193 mg/L.
- Groundwater from the Westbay piezometer had a $\text{HCO}_3\text{-Ca-Na-SO}_4$ type composition (Figure 7.III.3-1). There was no variation in major ion chemistry with depth. Groundwater from the Westbay piezometer was enriched in calcium and carbonate relative to groundwater from wells 03-283, 03-282 and 03-281, which are also located in mineralized rock in the ore zone,
- Dissolved concentrations of aluminum (0.498 to 0.612 mg/L), arsenic (0.0389 to 0.0847 mg/L), and molybdenum (0.069 to 0.08 mg/L) were elevated with respect to the site-specific water quality objectives.
- Most trace metals had a similar range of concentration to samples collected from groundwater monitoring locations 03-281, 03-282, and 03-283, which are also located in mineralized rock within the perimeter of the Open Pit.

Table 7.III.3-2b

Summary of Results of Water Quality Monitoring from Monitoring Wells within the Open Pit - Westbay Monitoring Well 10-291

PARAMETER	UNITS	Site Specific Water Quality Objectives	10-291-86 17-Aug-10	10-291-116 17-Aug-10	10-291-160 17-Aug-10
GENERAL PARAMETERS					
pH	pH units		8.31	8.28	8.17
Conductivity	uS/cm		317	316	306
Alkalinity	mg/L as CaCO ₃		102	102	99.6
Hardness ²	mg/L as CaCO ₃		78.7	89.4	84.4
Bicarbonate (HCO ₃)	mg/L		117	124	122
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	< 5.0
Total Dissolved Solids (TDS)	mg/L		192	193	191
ANIONS & NUTRIENTS					
Chloride (Cl)	mg/L	353	7.98	8.04	7.93
Sulphate (SO ₄)	mg/L	500	55	54.7	52.6
DISSOLVED METALS (ICP-MS)					
Aluminum (Al)	mg/L	0.16	0.506	0.498	0.612
Antimony (Sb)	mg/L	0.03	< 0.20	< 0.20	0.00395
Arsenic (As)	mg/L	0.05	0.0522	0.0847	0.0389
Cadmium (Cd)	mg/L	0.00015	0.000108	0.000098	< 0.010
Cobalt (Co)	mg/L	0.004	0.00028	< 0.010	0.00034
Copper (Cu)	mg/L	0.022	< 0.010	0.0322	< 0.010
Lead (Pb)	mg/L	0.001	< 0.05	< 0.05	< 0.05
Molybdenum (Mo)	mg/L	0.073	0.069	0.073	0.08
Selenium (Se)	mg/L	0.0035	< 0.00040	< 0.00040	< 0.00040
Uranium (U)	mg/L	0.027	0.00154	0.00165	0.00154
Zinc (Zn)	mg/L	0.11	0.0085	0.0115	0.0076

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives

7.III.3.5 Groundwater Piezometer Located within the Perimeter of the Open Pit: 97-051

Piezometer 97-051 is located on a ridge within the boundary of the proposed Open Pit (Table 7.III.3-1). In 2010, a piezometer was installed in an inclined exploration borehole that was drilled in 1997. Samples are collected from a depth of 125 m bgs; the depth of this hole is assumed to encounter the decline of the underground exploration ramp. Detailed results of water quality analysis are provided in Attachment 7.III.II-5. The composition of the water quality sample collected from 97-051 is summarized in Table 7.III.3-2c.

The pH of water collected from this hole was approximately 8.4. The total dissolved solids concentration varied from 212 to 242 mg/L. Groundwater from this location had a $\text{HCO}_3\text{-Ca-Mg}$ type composition.

The only parameter to exceed the site-specific water quality objective was arsenic (0.42 mg/L) in one sample collected in summer 2010. Concentrations of most dissolved metals were less than the analytical detection limits in a sample collected in winter 2011.

7.III.3.6 Groundwater Piezometers Located Southwest of the Open Pit: MC-04-01 and MC-04-12

Groundwater piezometers MC-04-01 and MC-04-12 are located southwest of the proposed Open Pit. Groundwater samples collected from MC-04-01 and MC-04-12 in August 2009 and August 2010 represent groundwater that is in contact with quartz-feldspar porphyry bedrock and siltstone bedrock, respectively. Detailed results of water quality analysis are provided in Attachments 7.III.II-6 and 7.III.II-7. The composition of samples collected from MC-04-01 and MC-04-12 is summarized in Table 7.III.3-2d. The following points highlight some of the results.

- Groundwater collected from both wells had neutral pH, ranging from 6.53 to 7.34. This pH range is typical of shallow, oxygenated groundwater (Langmuir 1997).
- Total dissolved solids concentrations varied between 68 and 114 mg/L.
- Groundwater had a $\text{HCO}_3\text{-Ca-Mg}$ type composition (Figure 7.III.3-1).
- Dissolved concentrations of aluminum (0.06 to 0.49 mg/L) and cobalt (0.0005 to 0.01 mg/L) were elevated with respect to the site-specific water quality objectives.

Table 7.III.3-2c
Summary of Results of Water Quality Monitoring from Piezometer 97-051

PARAMETER	UNITS	Site Specific Water Quality Objectives	97-051 16-Aug-10	97-051 21-Feb-11
GENERAL PARAMETERS				
pH	pH units		8.36	8.42
Conductivity	uS/cm		349	354
Alkalinity	mg/L as CaCO ₃		134	140
Hardness ²	mg/L as CaCO ₃		127	112
Bicarbonate (HCO ₃)	mg/L		150	165
Carbonate (CO ₃)	mg/L		6.5	<5.0
Total Dissolved Solids (TDS)	mg/L		212	249
ANIONS & NUTRIENTS				
Chloride (Cl)	mg/L	353	5.04	0.5
Sulphate (SO ₄)	mg/L	500	50.3	48.7
DISSOLVED METALS (ICP-MS)				
Aluminum (Al)	mg/L	0.16	< 0.20	<0.20
Antimony (Sb)	mg/L	0.03	0.00867	<0.20
Arsenic (As)	mg/L	0.05	0.416	<0.20
Cadmium (Cd)	mg/L	0.00015	< 0.010	<0.010
Cobalt (Co)	mg/L	0.004	< 0.010	<0.010
Copper (Cu)	mg/L	0.022	< 0.010	<0.010
Lead (Pb)	mg/L	0.001	< 0.0001	<0.050
Molybdenum (Mo)	mg/L	0.073	0.033	<0.030
Selenium (Se)	mg/L	0.0035	< 0.00040	<0.20
Uranium (U)	mg/L	0.027	0.0257	0.0145
Zinc (Zn)	mg/L	0.11	< 0.0050	<0.0050

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Table 7.III.3-2d

Summary of Results of Water Quality Monitoring from Monitoring Wells Southwest of the Open Pit -
MC-04-01 and MC-04-12

PARAMETER	UNITS	Site Specific Water Quality Objectives	MC-04-01 29-Aug-09	MC-04-01 16-Aug-10	MC-04-12 28-Aug-09
GENERAL PARAMETERS					
pH	pH units		7.34	6.53	7.28
Conductivity	uS/cm		144	87	78.9
Alkalinity	mg/L as CaCO ₃		60.4	35.6	31.6
Hardness ²	mg/L as CaCO ₃		105	66.3	33.7
Bicarbonate (HCO ₃)	mg/L		73.7	43.5	38.6
Carbonate (CO ₃)	mg/L		< 5.0	<5.0	< 5.0
Total Dissolved Solids (TDS)	mg/L		114	71.3	68
ANIONS & NUTRIENTS					
Chloride (Cl)	mg/L	353	<0.50	5.88	<0.50
Sulphate (SO ₄)	mg/L	500	9.75	10.3	6.9
DISSOLVED METALS (ICP-MS)					
Aluminum (Al)	mg/L	0.16	0.0621	0.49	0.469
Antimony (Sb)	mg/L	0.03	<0.00040	<0.20	<0.00040
Arsenic (As)	mg/L	0.05	0.00041	<0.00040	0.00086
Cadmium (Cd)	mg/L	0.00015	<0.000050	<0.010	<0.000050
Cobalt (Co)	mg/L	0.004	0.0005	0.01	0.00055
Copper (Cu)	mg/L	0.022	0.00333	0.00857	0.0123
Lead (Pb)	mg/L	0.001	<0.00010	0.00015	0.0003
Molybdenum (Mo)	mg/L	0.073	0.00329	<0.030	0.00075
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	<0.00040
Uranium (U)	mg/L	0.027	0.00882	0.00568	0.00174
Zinc (Zn)	mg/L	0.11	0.003	0.0152	0.0023

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

7.III.3.7 Groundwater Piezometer Located in the Flow Path between the Plant Site and Nico Lake: EBA-04-06

Groundwater piezometer EBA-04-06 is located in the flow path between the plant site and Nico Lake. Groundwater collected from EBA-04-06 in August 2009 consists of shallow groundwater in contact with siltstone bedrock. Attachment 7.III.II-8 presents the composition of groundwater collected from EBA-04-06. The following points highlight some of the results.

- The field pH of this sample was 7.6. This pH range is typical of shallow, oxygenated groundwater (Langmuir 1997).
- The total dissolved solids content of this sample was 164 mg/L. Groundwater had a $\text{HCO}_3\text{-Ca-Mg}$ type composition (Figure 7.III.3-1).
- Dissolved metal concentrations were not elevated with respect to the site-specific water quality objectives.

7.III.3.8 Groundwater Piezometer Located North of the Co-Disposal Facility/North of Nico Lake: GA-10-21D

GA-10-21D is located north of the proposed Co-Disposal Facility. Groundwater collected from GA-10-21D represents consists of shallow groundwater in contact with volcanic bedrock (lapilli tuff). Two samples were collected from GA-10-21D in 2010 (Attachment 7.III.II-9). Table 7.III.3-2e summarizes the composition of groundwater collected from GA-10-21D. The following points highlight some of the results.

- The pH of water at GA-21D was approximately 8 in both sample events, which is typical of shallow, oxygenated groundwater (Langmuir 1997).
- The total dissolved solids content of water from GA-10-21D varied from 170 to 258 mg/L. Groundwater had a $\text{HCO}_3\text{-Ca-Mg}$ type composition.
- Most dissolved metal concentrations were not elevated with respect to the site-specific water quality criteria. Cobalt (0.003 to 0.01 mg/L) and uranium (0.03 to 0.05 mg/L) exceeded the site-specific water quality criteria in the sample collected in August 2010.

7.III.3.9 Groundwater Piezometer Located East of the Co-Disposal Facility/North of Nico Lake: GA-06-12

GA-06-12 is located adjacent to proposed Seepage Collection Pond 1. Groundwater collected from GA-06-12 consists of shallow groundwater in contact with siltstone and rhyolite bedrock. Attachment 7.III.II-10 presents the composition of groundwater samples collected from GA-06-12 in 2009 and 2010. Table 7.III.3-2e summarizes the composition of groundwater samples collected from GA-06-12. The following points highlight some of the results.

- The field pH of water from GA-06-12 was 7.6, which is typical of shallow, oxygenated groundwater (Langmuir 1997).
- The total dissolved solids content of water from GA-06-12 varied between 137 and 160 mg/L. Groundwater had a $\text{HCO}_3\text{-Ca-Mg}$ type composition.

Table 7.III.3-2e

Summary of Results of Water Quality Monitoring from Monitoring Wells in the Vicinity of the Co-Disposal Facility - GA-10-21D, GA-06-12, GA-10-18 and GA-10-27

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-21 12-Jun-10	GA-10-21 15-Aug-10	GA-06-12 29-Aug-09	GA-06-12 12-Jun-10	GA-06-12 15-Aug-10	GA-10-18S 12-Jun-10	GA-10-18S 15-Aug-10	GA-10-18D 15-Aug-10	GA-10-27S 16-Jun-10	GA-10-27S 14-Aug-10	GA-10-27D 16-Jun-10	GA-10-27D 14-Aug-10
GENERAL PARAMETERS														
pH	pH units		7.95	8.02	7.86	8.12	8.04	7.31	6.59	7.59	8.23	8.1	8.3	8.24
Conductivity	uS/cm		458	287	223	261	244	106	269	497	469	382	337	336
Alkalinity	mg/L as CaCO ₃		199	131	109	127	119	36.9	126	222	252	211	143	140
Hardness ²	mg/L as CaCO ₃		148	110	116	122	108	32.6	104	173	240	189	157	146
Bicarbonate (HCO ₃)	mg/L		243	160	133	155	145	45	154	270	308	258	172	171
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5.0	< 5.0
Total Dissolved Solids (TDS)	mg/L		258	170	160	137	139	62	150	275	248	207	184	197
ANIONS & NUTRIENTS														
Chloride (Cl)	mg/L	353	3.55	5.27	<0.50	<0.50	5.15	0.69	5.67	2.68	2.1	5.83	0.86	5.15
Sulphate (SO ₄)	mg/L	500	39.5	22.1	5.98	9.93	10.2	15.3	12.4	47.4	2.23	2.13	35.3	37.1
DISSOLVED METALS (ICP-MS)														
Aluminum (Al)	mg/L	0.16	0.041	<0.20	0.0078	<0.010	<0.20	0.194	0.206	0.198	0.0228	<0.2	0.0052	<0.2
Antimony (Sb)	mg/L	0.03	0.00248	<0.20	0.00072	0.00099	<0.20	<0.00040	<0.20	<0.20	0.00113	0.00054	<0.00040	<0.00040
Arsenic (As)	mg/L	0.05	0.00485	0.00234	<0.00040	<0.00040	<0.00040	0.0152	0.0213	0.0825	0.011	0.00568	0.0035	0.00334
Cadmium (Cd)	mg/L	0.00015	<0.00010	<0.010	<0.000050	<0.00010	0.000057	<0.00010	<0.010	<0.010	0.000095	<0.010	0.000055	<0.000050
Cobalt (Co)	mg/L	0.004	0.00302	0.0131	0.00013	0.00122	<0.010	0.00356	0.01	0.0193	0.00052	0.014	0.00022	<0.010
Copper (Cu)	mg/L	0.022	0.00094	0.00069	<0.00060	0.0006	<0.010	0.00649	0.0161	0.00119	0.00197	<0.00060	<0.00060	<0.00060
Lead (Pb)	mg/L	0.001	0.00037	<0.00010	<0.00010	<0.00010	<0.050	0.00019	<0.050	0.00012	<0.00010	<0.00010	<0.00010	<0.00010
Molybdenum (Mo)	mg/L	0.073	0.0156	<0.030	0.00594	0.00658	0.00553	0.00158	<0.030	0.00293	0.0557	0.00677	0.0245	0.00509
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	<0.00040	---	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Uranium (U)	mg/L	0.027	0.0393	0.051	0.0491	0.0563	0.0504	0.00048	0.00088	0.00451	0.0512	0.00632	0.0127	0.0129
Zinc (Zn)	mg/L	0.11	0.0036	<0.0050	0.0014	0.0015	0.0018	0.0048	0.0265	<0.0050	<0.0010	<0.0050	<0.0010	<0.0050

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

- Dissolved metals concentrations were generally not elevated with respect to the reference criteria.

7.III.3.10 Groundwater Piezometer Located East of the Co-Disposal Facility/North of Nico Lake: GA-10-18S/D

GA-10-18 is located in the low-lying area between Nico Lake and proposed Seepage Collection Pond No. 2. Two piezometers were installed at GA-10-18. GA-10-18S represents shallow, near surface groundwater (3.7 m bgs) in contact with glacial sediments (i.e., aggregate). GA-10-18D represents shallow groundwater (10.2 m bgs) in contact with bedrock (i.e., schist). Attachment 7.III.II-11 presents the composition of groundwater samples collected from GA-10-18S in 2010; the composition of the samples collected from GA-10-18D is presented in Attachment 7.III.II-12.

Table 7.III.3-2e summarizes the composition of groundwater samples collected from GA-10-18. The following points highlight some of the results.

- The pH of shallow groundwater collected from GA-10-18S varied between 6.6 and 7.3. Total dissolved solids concentrations ranged from 62 to 160 mg/L. Dissolved metals that occurred at concentrations greater than the site-specific water quality objectives included aluminum (0.19 to 0.20 mg/L), arsenic (0.015 to 0.02 mg/L), and cobalt (0.003 to 0.01 mg/L).
- The pH of groundwater from GA-10-18D was 7.6. The total dissolved solids content was 275 mg/L. Dissolved metals that occurred at concentrations greater than the site-specific water quality objectives included aluminum (0.20 mg/L), arsenic (0.08 mg/L), and cobalt (0.02 mg/L).
- The pH of water collected from GA-10-27 was typical of shallow, oxygenated groundwater (Langmuir 1997).
- Groundwater at GA-10-18S/D had a $\text{HCO}_3\text{-Ca-Mg}$ type composition. There was no difference in the major ion composition in groundwater collected from the 2 sample depths.

7.III.3.11 Groundwater Piezometer Located Southeast of the Co-Disposal Facility and Plant Site/West of Nico Lake: GA-10-27S/D

GA-10-27D/S is located in between Nico Lake and the Mineral Processing Plant site. Two piezometers were installed at GA-10-27. GA-10-27S represents shallow, near surface groundwater (3 m bgs) in contact with glacial sediments (i.e., aggregate). GA-10-27D represents shallow groundwater (18 m bgs) in contact with metasedimentary bedrock and quartz-feldspar porphyry bedrock. Attachments 7.III.II-13 and 7.III.II-14 present the composition of water quality samples from GA-10-27S and GA-10-27D, respectively.

Table 7.III.3-2e summarizes the composition of groundwater samples collected from GA-10-27:

- The pH of shallow groundwater collected from GA-10-27S ranged from 8.1 to 8.2. The total dissolved solids content of water at GA-10-27S was 207 to 248 mg/L. Dissolved metal concentrations were generally less than the site-specific water quality objectives.
- The pH of groundwater from GA-10-27D varied between 8.2 and 8.3. The total dissolved solids content of water at GA-10-27D was 184 to 197 mg/L. Dissolved metal concentrations were less than the site-specific water quality objectives.

- The pH of water collected from GA-10-27 was typical of shallow, oxygenated groundwater (Langmuir 1997).
- Groundwater at GA-10-27S/D had a $\text{HCO}_3\text{-Ca-Mg}$ type composition. There was no difference in the major ion composition in groundwater collected from the 2 sample depths.

7.III.3.12 Artesian Flow

Artesian flow was observed at hole 10-290. Water from hole 10-290, located within the footprint of the Open Pit, was submitted for analysis of total metals only. The results of analysis of groundwater collected from 10-290 are presented in Attachment 7.III.II-15.

7.III.3.13 SEEP1

SEEP1 is seepage monitoring point located in the vicinity of the Grid Pond. SEEP1 is collected from a point where water accumulates in the middle of the road access to Little Grid Pond below the portal and mine rock area. Fortune has noted that water often flows at surface; the water at this zone could represent a natural groundwater seep, or runoff from the portal basin area.

Detailed results of analysis of water collected from SEEP1 in 2007 and 2010 are presented in Attachment 7.III.II-16. Table 7.III.3-3 summarizes the results of analysis.

The pH of water at SEEP1 varied between 7.9 and 8.1. The total dissolved solid concentration of groundwater seepage varied from 239 to 260 mg/L. Water at SEEP1 had a $\text{HCO}_3\text{-Ca-Mg}$ type composition. Dissolved metal concentrations were generally less than the site-specific water quality objectives.

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Table 7.III.3-3: Summary of Results of Water Quality Monitoring from Groundwater Seepage Monitoring Point SEEP1

Parameter	Units	Site-Specific Water Quality Objectives	SEEP1	SEEP1	SEEP1	SEEP1
			2-Aug-07	17-Jun-10	20-Jul-10	08-SEP-10
General Parameters						
pH	pH units			8.14	7.94	7.89
Conductivity	uS/cm			393	403	426
Alkalinity	mg/L as CaCO ₃		40.1	107	105	113
Hardness ²	mg/L as CaCO ₃		361	173	168	169
Bicarbonate (HCO ₃)	mg/L		48.9	130	129	138
Carbonate (CO ₃)	mg/L		<0.5	<5.0	<5.0	<5.0
Total Dissolved Solids (TDS)	mg/L				239	260
Anions & Nutrients						
Chloride (Cl)	mg/L	353	8.8	1.52	1.18	2.47
Sulphate (SO ₄)	mg/L	500	37.6	51.4	41.5	43.7
Dissolved Metals (Icp-MS)						
Aluminum (Al)	mg/L	0.16	0.0211	---	0.0172	0.016
Antimony (Sb)	mg/L	0.03	0.00189	---	0.00183	0.00141
Arsenic (As)	mg/L	0.05	0.0228	---	0.0298	0.0369
Cadmium (Cd)	mg/L	0.00015	0.00002	---	< 0.000050	<0.00010
Cobalt (Co)	mg/L	0.004	0.0106	---	< 0.010	0.00351
Copper (Cu)	mg/L	0.022	0.0032	---	0.00501	0.00354
Lead (Pb)	mg/L	0.001	0.00007	---	< 0.050	<0.00010
Molybdenum (Mo)	mg/L	0.073	0.0042	---	< 0.030	0.00847
Selenium (Se)	mg/L	0.0035	<0.0005	---	< 0.20	<0.00040
Uranium (U)	mg/L	0.027	0.00128	---	0.00853	0.0102
Zinc (Zn)	mg/L	0.11	0.0011	---	< 0.0050	0.0012

0.3 Indicates that the parameter occurs at a concentration in excess of the site-specific water quality objectives.

7.III.4 QUALITY CONTROL

The following quality control samples were prepared during the collection of groundwater samples.

- Field blanks were prepared during the 2009 and 2010 sample collections (Attachment 7.III.III-1). The field blank consists of reagent grade distilled water. Notable results observed in the field blanks were evaluated relative to variable concentrations observed in the water samples to determine if wide-spread contamination might have occurred or if any potential contamination was limited to the specific blank(s).
- Replicate samples were collected at one station during each of the 2004 and 2009 sample campaigns (Attachment 7.III.III-2). Field replicate samples are independent samples collected from a piezometer at the same time, but stored in separate containers and analyzed independently. Field replicate samples are

collected and analyzed as an indication of overall precision in the laboratory and the field (USEPA 2002). Field replicates were not prepared during any of the 2010 sample campaigns.

7.III.4.1 Field Blank

Attachment 7.III.III-1 presents the composition of the field blank samples, prepared with reagent grade distilled water. The pH of field blank samples was 5.95 (2009) and 5.87 (2010), which is characteristic of distilled water. Concentrations of all parameters were less than the analytical detection limits (Attachment 7.III.III-1).

7.III.4.2 Replicate Samples

Replicate samples were submitted for analysis during the 2004 and 2009 sample programs (Attachment 7.III.III-2). A screening level analysis of the replicate results was performed as per the recommendations in the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA 2002). The Relative Percent Differences (RPD) between the replicated samples' analyses were performed according to Equation 1:

$$RPD(\%) = \frac{|original - duplicate|}{(original + duplicate)/2} \times 100 \quad (\text{Equation 1})$$

In the context of this memorandum, an RPD criterion of 20% was set to compare the results for the replicated samples. Several parameters exceeded the RPD criterion in the replicate sample collected from 03-283 in 2004. The replicated samples collected from 03-281 in 2009 had very similar compositions, with relatively few parameters reporting RPDs greater than the control limit.

7.III.4.3 General Chemistry

Total metal concentrations in groundwater samples collected in 2009 and 2010 were up to 1 to 2 orders of magnitude greater than dissolved metal concentrations measured in the same sample by the same analytical method (i.e., ICP-MS). The analytical laboratory indicated that it is not uncommon for dissolved concentrations to appear greater than total as a function of analytical uncertainty, particularly at low concentrations. The total fraction in groundwater, representative of particulate matter, is generally not considered mobile. Total concentrations may have been affected by sediment disturbed in the well during sample collection.

7.III.5 SUMMARY

The results of groundwater monitoring at the NICO Project site indicate that the composition of groundwater varies by location and depth:

- Groundwater collected from deep piezometers screened in the ore body (03-281, 03-282 and 03-283, and Westbay monitoring well 10-291) had an alkaline pH. Dissolved concentrations of aluminum, arsenic, cobalt, molybdenum, and uranium were elevated with respect to the site-specific water quality criteria.
- Groundwater collected from hole 97-051 (on a ridge within the boundary of the proposed Open Pit) had elevated concentrations of arsenic.
- The composition of shallow groundwater collected from piezometers in the vicinity of proposed site infrastructure, including the proposed tailings and mine rock Co-Disposal Facility, the Mineral Processing

Plant, and Open Pit varied in composition. Concentrations of aluminum, arsenic, cobalt, uranium, and zinc were locally elevated with respect to the site-specific water quality objectives.

- No parameters occurred at concentrations in excess of the site-specific water quality objectives samples collected from SEEP1.

7.III.6 REFERENCES

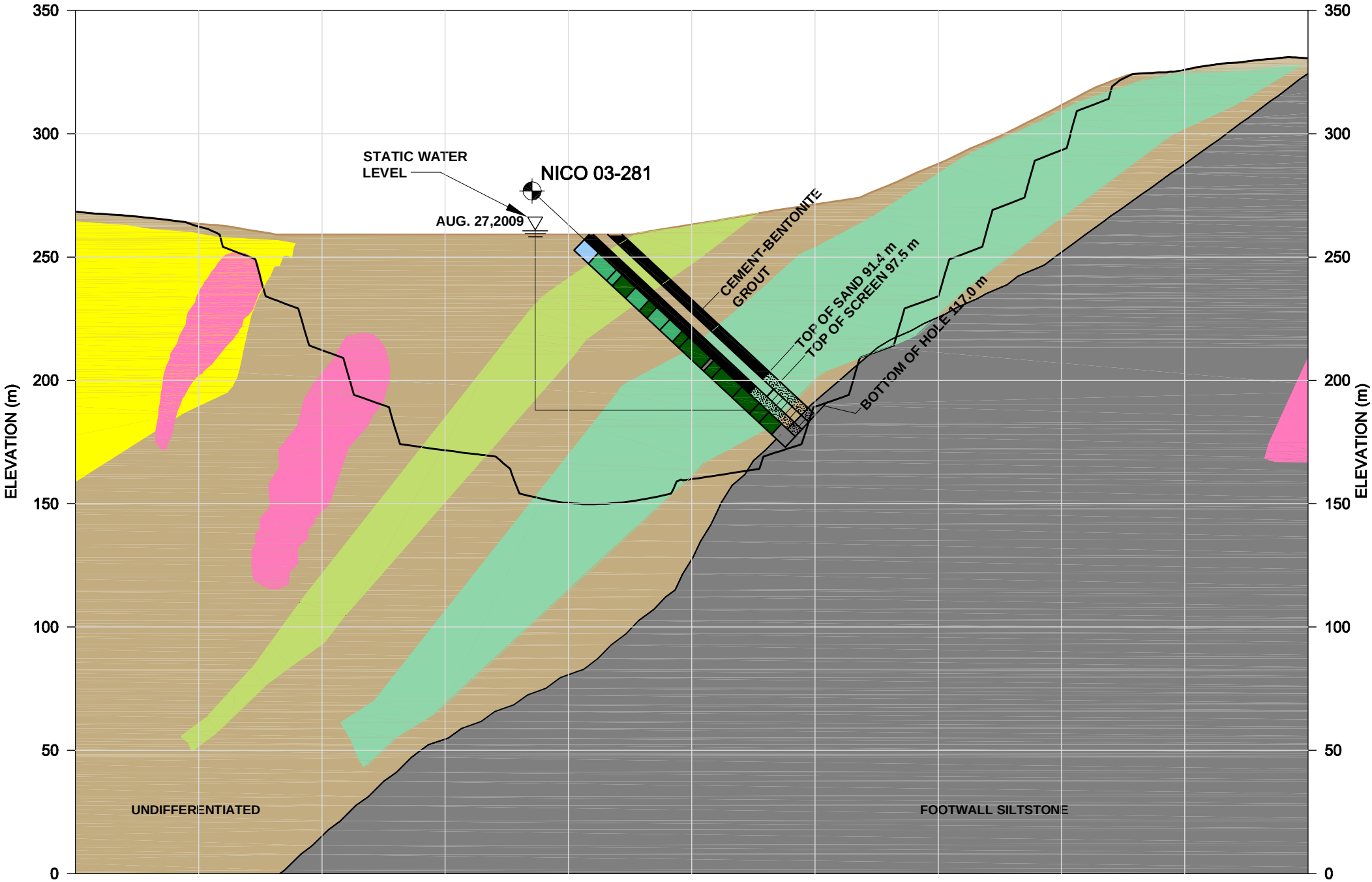
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USEPA. 2002. USEPA contract laboratory program national functional guidelines for inorganic data review – final. EPA 540-R-01-008. July 2002

ATTACHMENT 7.III.I

Borehole Logs

PLOT DATE: December 14, 2009
FILENAME: T:\Projects\2008\08-1118-0043 Fortune Minerals, Yellowknife - NICO Mine\1A-0811180043\A001.dwg



QUICK LOG TABLE NICO-03-281

FROM (m) *	TO (m) *	LITHOLOGY
0	7.92	Casing
7.92	17.95	BRS With/without mt
17.95	21.1	BRS With/without mt
21.1	28.48	BRS With mt
28.48	35.98	BRS With/without mt
35.98	40.32	BRS With mt
40.32	47.46	BRS With/without mt
47.46	54.44	BRS With/without mt
54.44	58.04	BRS With mt
58.04	70.29	BRS With mt
70.29	71.82	Siltstone
71.82	76.12	BRS With mt
76.12	87.61	BRS With mt
87.61	97.17	BRS With mt
97.17	102.57	BRS With mt
102.57	109.52	BRS With mt
109.52	117.04	Siltstone

* DOWNHOLE MEASUREMENTS

NOTES:

1. GEOLOGY, AND PIT SHELL INFORMATION WERE RECEIVED FROM GENE PURITCH INDEPENDANT MINE CONSULTANT (2009), AND FORTUNE MINERALS (JULY 2004).

SIMPLIFIED BEDROCK LITHOLOGY

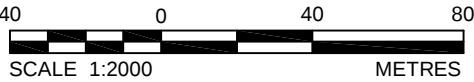
I) IGNEOUS INTRUSIVES (DYKES)	III) SNARE GROUP METASEDIMENTARY ROCKS (SUB-ARKOSIC WACKES, DOLOMITES, ARENITES AND SILTSTONES)
FELDSPAR - PORPHYRITIC	UPPER ZONE
QUARTZ - FELDSPAR	MIDDLE ZONE
	LOWER ZONE
II) FABER LAKE GROUP VOLCANIC ROCKS	UNDIFFERENTIATED
K-SPAR ALTERED RHYOLITE	FOOTWALL SILTSTONE

DETAILED DRILLHOLE LITHOLOGY

CASING	FP/QFP
BRECCIA	RHYOLITE
BRS WITH MT	SILTSTONE
BRS WITH/WITHOUT MT	SUBARKOSIC WACKE
	MAFIC DYKE

BOREHOLE LOCATION

N0.	NORTH (m)	EAST (m)	ELEV. (m)	AZIMUTH	DIP	DEPTH (m)
NICO 03-0281	7046896.38	512026.72	262.98	204.45°	-45°	117.04





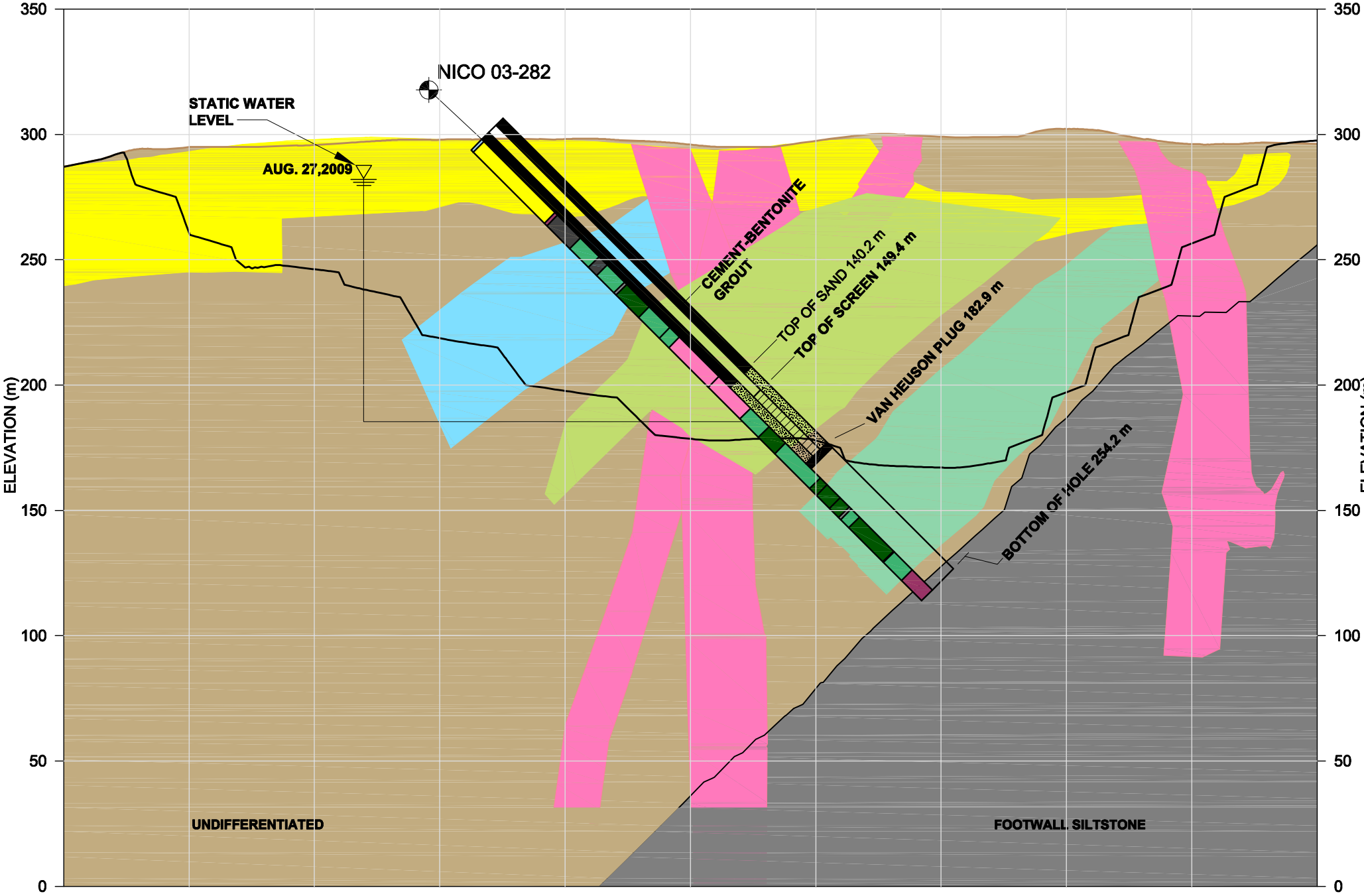
Mississauga, Ontario, Canada

FILE No.	0811180043IA001.dwg
PROJECT No.	08-1118-0043 (3000)
REV.	A

SCALE	AS SHOWN
DATE	Dec. 14, 2009
DESIGN	CP
CAD	JFC
CHECK	LB
REVIEW	MR

TITLE	
BOREHOLE NICO 03-281 SECTION THROUGH OPEN PIT SHOWING GEOLOGY	
FORTUNE MINERALS LTD. NICO PROJECT	
FIGURE	A1

PLOT DATE: December 14, 2009
FILENAME: T:\Projects\2008\08-1118-0043 Fortune Minerals, Yellowknife - NICO Mine\ -IA- \0811180043\A002.dwg



QUICK LOG TABLE NICO-03-282

FROM (m) *	TO (m) *	LITHOLOGY
0	1.22	Casing
1.22	41.3	Rhyolite
41.3	42.73	Breccia
42.73	55.65	Subarkosic Wacke
55.65	66.2	BRS With/without mt
66.2	70.8	Subarkosic Wacke
70.8	80.57	BRS With/without mt
80.57	81.8	Siltstone
81.8	94.47	BRS With mt
94.47	106.12	BRS With/without mt
106.12	111.5	BRS With/without mt
111.5	133.8	FP/QFP
133.8	151.69	FP/QFP
151.69	162.13	BRS With/without mt
162.13	171.33	BRS With mt
171.33	191.01	BRS With/without mt
191.01	194.89	BRS With mt
194.89	202.18	BRS With mt
202.18	207.34	BRS With mt
207.34	208.49	Siltstone
208.49	213.13	BRS With/without mt
220.13	232.31	BRS With mt
232.31	232.64	FP/QFP
232.64	242.86	BRS With/without mt
242.86	254.2	Breccia

* DOWNHOLE MEASUREMENTS

NOTES:

1. GEOLOGY, AND PIT SHELL INFORMATION WERE RECEIVED FROM GENE PURITCH INDEPENDANT MINE CONSULTANT (2009), AND FORTUNE MINERALS (JULY 2004).

SIMPLIFIED BEDROCK LITHOLOGY

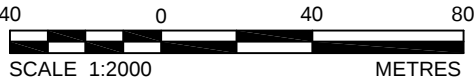
I) IGNEOUS INTRUSIVES (DYKES)	III) SNARE GROUP METASEDIMENTARY ROCKS (SUB-ARKOSIC WACKES, DOLOMITES, ARENITES AND SILTSTONES)
FELDSPAR - PORPHYRITIC	UPPER ZONE
QUARTZ - FELDSPAR	MIDDLE ZONE
	LOWER ZONE
II) FABER LAKE GROUP VOLCANIC ROCKS	UNDIFFERENTIATED
K-SPAR ALTERED RHYOLITE	FOOTWALL SILTSTONE

DETAILED DRILLHOLE LITHOLOGY

CASING	FP/QFP
BRECCIA	RHYOLITE
BRS WITH MT	SILTSTONE
BRS WITH/WITHOUT MT	SUBARKOSIC WACKE
	MAFIC DYKE

BOREHOLE LOCATION

N0.	NORTH (m)	EAST (m)	ELEV. (m)	AZIMUTH	DIP	DEPTH (m)
NICO 03-0282	7046666.92	512681.41	298.00	202.25°	-44.5°	254.20

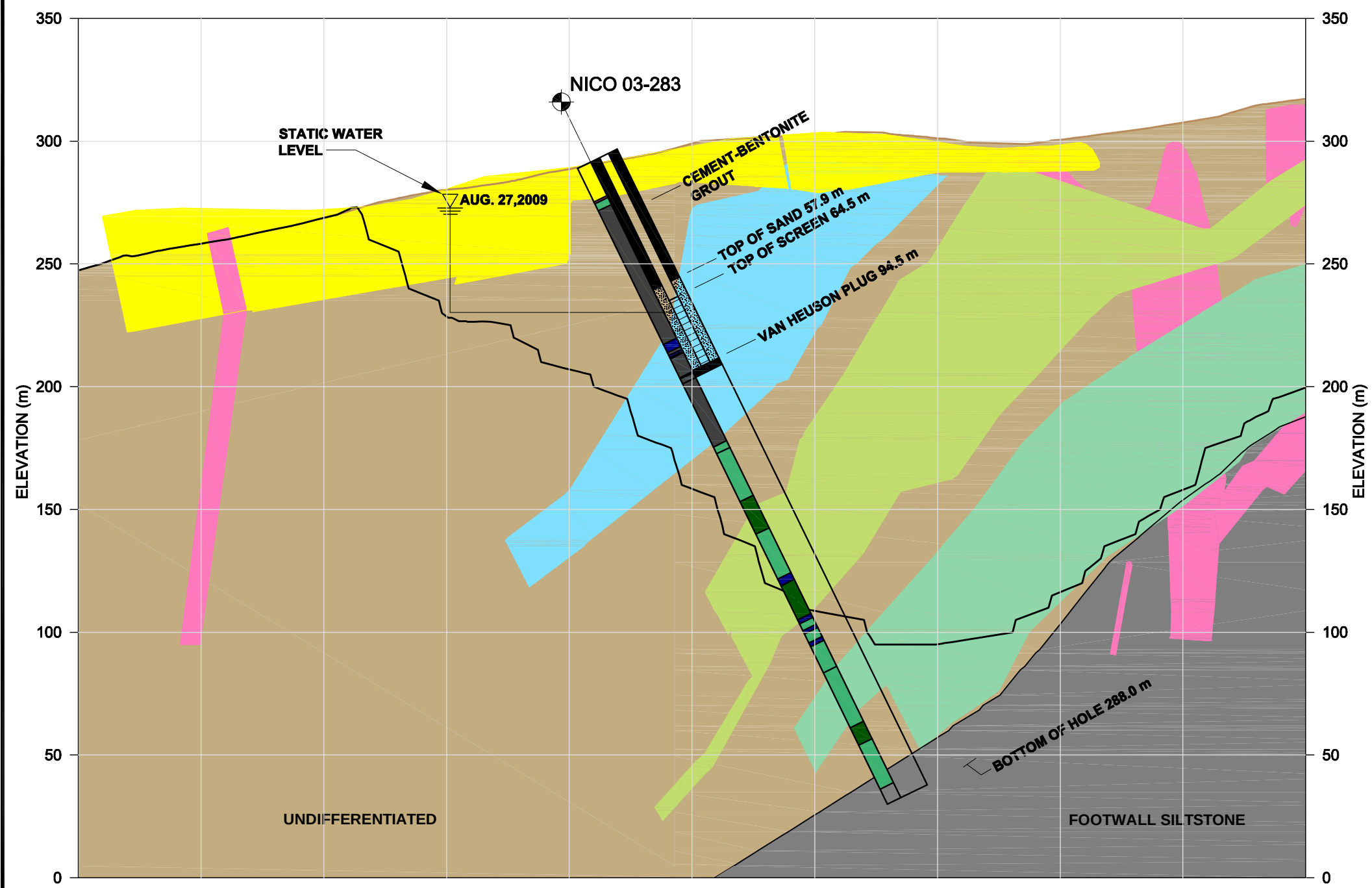




Mississauga, Ontario, Canada

FILE No.	0811180043IA002.dwg	SCALE	AS SHOWN	TITLE BOREHOLE NICO 03-282 SECTION THROUGH OPEN PIT SHOWING GEOLOGY	
PROJECT No.	08-1118-0043 (3000)	DATE	Dec. 14, 2009		
REV.	A	DESIGN	CP		
		CAD	JFC		
		CHECK	LB	FORTUNE MINERALS LTD. NICO PROJECT	FIGURE A2
		REVIEW	MR		

PLOT DATE: December 14, 2009
FILENAME: T:\Projects\2008\08-1118-0043 Fortune Minerals, Yellowknife - NICO Mine\ -IA-\0811180043\A003.dwg



SIMPLIFIED BEDROCK LITHOLOGY

I) IGNEOUS INTRUSIVES (DYKES)		III) SNARE GROUP METASEDIMENTARY ROCKS (SUB-ARKOSIC WACKES, DOLOMITES, ARENITES AND SILTSTONES)	
	FELDSPAR - PORPHYRITIC		UPPER ZONE
	QUARTZ - FELDSPAR		MIDDLE ZONE
II) FABER LAKE GROUP VOLCANIC ROCKS			LOWER ZONE
	K-SPAR ALTERED RHYOLITE		UNDIFFERENTIATED
			FOOTWALL SILTSTONE

DETAILED DRILLHOLE LITHOLOGY

	CASING		FP/QFP
	BRECCIA		RHYOLITE
	BRS WITH MT		SILTSTONE
	BRS WITH/WITHOUT MT		SUBARKOSIC WACKE
			MAFIC DYKE

BOREHOLE LOCATION

NO.	NORTH (m)	EAST (m)	ELEV. (m)	AZIMUTH	DIP	DEPTH (m)
NICO 03-0283	7046806.04	512518.70	291.49	210.70°	-64.50°	288.04



 Mississauga, Ontario, Canada		SCALE	AS SHOWN	BOREHOLE NICO 03-283 SECTION THROUGH OPEN PIT SHOWING GEOLOGY	
		DATE	Dec. 14, 2009		
		DESIGN	CP		
		CAD	JFC		
FILE No. 0811180043IA003.dwg		CHECK	LB	FORTUNE MINERALS LTD. NICO PROJECT	
PROJECT No. 08-1118-0043 (3000)		REV.	A		
		REVIEW	MR	FIGURE A3	

QUICK LOG TABLE NICO-03-283

FROM (m) *	TO (m) *	LITHOLOGY
0	15.2	Rhyolite
15.2	16.01	Breccia
16.01	19.23	BRS With/without mt
19.23	79.81	Subarkosic Wacke
79.81	83.49	Mafic Dyke
83.49	84.77	Subarkosic Wacke
84.77	85.67	Mafic Dyke
85.67	86.26	BRS With mt
86.26	94.9	Subarkosic Wacke
94.9	95.38	Mafic Dyke
95.38	97.63	Subarkosic Wacke
97.63	126.21	Subarkosic Wacke
126.21	129.26	BRS With/without mt
129.26	151.01	BRS With/without mt
151.01	165.74	BRS With mt
165.74	186.01	BRS With/without mt
186.01	189.12	Mafic Dyke
189.12	204.53	BRS With mt
204.53	206.31	Mafic Dyke
206.31	209.44	BRS With/without mt
209.44	210.89	Mafic Dyke
210.89	214.98	BRS With/without mt
214.98	216.7	Mafic Dyke
216.7	228.51	BRS With/without mt
228.51	253.34	BRS With/without mt
253.34	261.3	BRS With mt
261.3	281.23	BRS With/without mt
281.23	288.04	Siltstone

* DOWNHOLE MEASUREMENTS

NOTES:

- GEOLOGY, AND PIT SHELL INFORMATION WERE RECEIVED FROM GENE PURITCH INDEPENDANT MINE CONSULTANT (2009), AND FORTUNE MINERALS (JULY 2004).

Schlumberger Water Services

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Canada
Tel. +1.604.430.4272
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COMPLETION REPORT

Westbay System Monitoring Well:

NICO-10-291

NICO Development, NWT

Prepared for:

Fortune Minerals

275 Bay Street, Suite 203

Thunder Bay, Ontario

P7B 1R7

Prepared by:

Schlumberger Water Services

WB893

August 30, 2010

CONTENTS:

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1. INTRODUCTION	1
2 PREVIOUS ACTIVITIES	1
3 INSTALLATION	1
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3.2 Layout of Westbay Casing Components	2
3.3 Lowering of Westbay Components	2
3.4 Hydraulic Integrity Testing	2
3.5 Positioning of Westbay Components	2
3.6 Pre-Inflation Profile	3
3.7 Inflation of Westbay System Packers	3
4. FLUID PRESSURE MEASUREMENTS	3
5. OPERATOR TRAINING	3

APPENDIX

APPENDIX: NICO-10-291

1. Introduction

This report and the attached Appendix document the technical services carried out by Schlumberger Water Services (SWS) under Fortune Minerals P.O. # 1969 dated on March 3, 2010. A Westbay System monitoring well was installed in borehole NICO-10-291 at the NICO development, NWT.

SWS technical services representative Mr. Mark Lessard was on site for the installation of the Westbay System well and field operator training from July 13 to 18, 2010. This report documents the installation tasks and related QA checks. Mr. Jim Mucklow of Fortune Minerals provided assistance and supervision during the installation.

2. Previous Activities

A borehole with at a nominal 3.8-in diameter was drilled at 70-deg from horizontal using an HQ3 wireline coring method. Locally supplied water was used as the drilling fluid. Borehole testing (including three falling head tests using a single packer, drill rods and drill wireline system) were performed in the open borehole before the installation of the Westbay system.

Table 1, Summary of Westbay Well Installation

Monitoring Well No.	Installation Date	*Borehole Depth (m)	MP38 Casing Length (m)	No. Monitoring Zones	Surface Casing (diameter/depth)
NICO-10-291	July 13 - 15	199.0	194.1	4	4-in / 4.5-m

* Depth measured as length at 70-degrees from horizontal.

(Note: all depths are with respect to ground surface. Monitoring well reference elevations were not available at the time of writing).

The well was installed according to the procedure described below.

3. Installation

3.1 Preparation of Monitoring Well Design

Requested zone locations for the borehole were provided to SWS by Mr. Jim Mucklow of Fortune Minerals. A well design was created based on the requested zone locations. The well design was used to prepare a Casing Installation Log, which specifies the location of components in the well. Mr. Jim Mucklow reviewed and approved the log in the field prior to installation of the well. The Casing Installation Log as approved was used as an installation guide in the field. A copy of the log is located in the Appendix.

A measurement port coupling was included in each primary monitoring zone to provide the capability to measure fluid pressures and collect fluid samples. Measurement port couplings were also included in QA zones to provide QA testing capabilities and to permit operation of the squeeze relief venting capabilities of the Westbay Model No. 6055 packer inflation tool. A pumping port coupling was also included in each primary monitoring zone to provide purging and hydraulic conductivity testing capabilities. All pumping ports are Westbay Model 0224 mechanical ports. Mr. Jim Mucklow requested that optional polypropylene filters were to be installed over all measurement port couplings.

3.2 Layout of Westbay Casing Components

Prior to the installation, the Westbay System casing components were set out at the borehole according to the sequence indicated on the Casing Installation Log. Each casing length was numbered beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate Westbay System couplings were attached to the casing sections. Magnetic location collars were attached 0.6-m below the top of the measurement port couplings in the primary monitoring zones.

Each casing component was visually inspected. Serial numbers for each packer, pumping port and measurement port coupling were recorded on the Casing Installation Log. The component layout was confirmed with the log before the components were lowered into the borehole.

3.3 Lowering of Westbay Components

The open-hole water level in NICO-10-291 was less than 1-m below ground level, so the Westbay casing components were lowered into the borehole by hand. Clean water supplied by Fortune Minerals was added to the Westbay casing when necessary for testing of joint seals during lowering and to counter buoyancy. Each casing joint was tested with a minimum internal hydraulic pressure of 150 psi for one minute to confirm hydraulic seals. Records of each successful joint test and the placement of each casing component are noted on the Casing Installation Log by check marks.

3.4 Hydraulic Integrity Testing

After the Westbay casing string was lowered into the borehole, the water level inside the Westbay casing was monitored at a depth different from the open borehole water level for a minimum period of thirty minutes to confirm hydraulic integrity of the casing. The data from the hydraulic integrity test are shown on the last page of the Casing Installation Log in the Appendix and in Table 2 below.

Table 2, Borehole and Westbay Casing Water Levels

Well number	*Borehole water level (Ground Surface)	*Westbay water level (top of casing)
NICO-10-291	0.520-m	49.478-m

* Depths not corrected for borehole inclination.

3.5 Positioning of Westbay Components

After the components were lowered into the well, the Westbay casing string was positioned as illustrated on the Casing Installation Log. The datum for NICO-10-291 is with respect to ground surface. The Westbay casing string was supported in this position while packer inflation was carried out. The positioning of the Westbay casing components is based on the "nominal" lengths of Westbay casing components. The positioning calculations do not include allowances for borehole temperature or deviation effects.

The attached figure titled "MOSDAX Transducer Position" provides information to correlate the position of MOSDAX Transducer sensors to the reference position at the top of the Measurement Port. The attached figure titled "Dimensions of Packer Seals and Monitoring Zones" outlines the calculations used to determine the packer depths and zone length. A Summary Casing Log, which show the final "as-built" locations of the components in the well, is included in the Appendix. The depths of key items in the well are shown on Table 3.

3.6 Pre-inflation Profile

A pre-inflation pressure profile was carried out at the well prior to inflating the packers to confirm the proper operation and position of measurement ports and magnetic collars. The data confirmed that the ports operated properly and were positioned correctly in the well. A plot of the Pre-Inflation Piezometric levels in all zones is shown on Figure 1 in the Appendix.

3.7 Inflation of Westbay System Packers

The Westbay packers were inflated sequentially beginning at the bottom of the well using clean water provided by Fortune Minerals. The Westbay Model No. 6055 vented inflation tool was used for packer inflation. The data for inflation of each packer are provided on the Westbay Packer Inflation Records included in the Appendix.

4. Fluid Pressure Measurements

After packer inflation was completed, fluid pressures were measured at each measurement port. At that time, the in-situ formation pressures may not have recovered from the pre-installation activities. Longer term monitoring may be required to establish representative fluid pressures.

A plot of the Piezometric levels in all zones in the well is shown on Figure 2 in the Appendix. A plot of the Piezometric levels in monitoring zones only is shown on Figure 3 in the Appendix. The data were examined to confirm proper operation of the measurement ports and as a check on the presence of annulus seals between monitoring zones. The calculation sheets for the pressure profile of the Westbay System monitoring well are also enclosed in the Appendix. Plots of the Piezometric levels corrected for the borehole angle (70-deg from horizontal) are shown on Figures 4 to 6 respectively in the Appendix.

5. Operator Training

Training was provided to Mr. Jim Mucklow of Fortune Minerals. The training covered the following areas:

- Operation and maintenance of Model 2531 Sampler Probe and PCI controller in pressure profiling and sample collection.
- Operation and maintenance of Model 6012 open/close tool (for operation of pumping ports) and operation of the Model 3033 manual cable reel.
- Cable reheading and troubleshooting.

Mr. Mucklow is certified for un-supervised operation and field maintenance of this Westbay equipment.

Table 3, Depths of Key Items for Westbay Monitoring Well NICO-10-291.

Zone No.	Monitoring Interval* (m)	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position (m) ***	Measurement Port Depth** (m)	Magnetic Collar Depth (m)	Pumping Port Depth** (m)	Corrected Measurement Port Depth**** (m)
Zone 1	188.0-199.0	1-2	---	---	---	188.0	188.6	191.0	176.7
Packer	---	3	1	17356	186.5	---	---	---	---
QA1	171.2-186.5	4-8	---	---	---	171.2	---	---	160.9
Packer	---	9	2	17352	169.7	---	---	---	---
Zone 2	160.6-169.7	10-12	---	---	---	160.6	161.2	163.6	150.9
Packer	---	13	3	17351	159.0	---	---	---	---
QA2	126.4-159.0	14-25	---	---	---	126.4	---	---	118.8
Packer	---	26	4	17350	124.9	---	---	---	---
Zone 3	115.2-124.9	27-30	---	---	---	115.2	115.8	118.2	108.2
Packer	---	31	5	17355	113.6	---	---	---	---
QA3	96.3-113.6	32-38	---	---	---	96.3	---	---	90.5
Packer	---	39	6	17354	94.7	---	---	---	---
Zone 4	85.6-94.7	40-42	---	---	---	85.6	86.2	88.6	80.4
Packer	---	43	7	17349	84.1	---	---	---	---
Riser	---	44-72	---	---	---	---	---	---	---

* Depths are with respect ground surface along borehole axis.

** Component positions are referenced to the top of the subject Westbay System coupling.

*** Packer positions are referenced to the top Westbay System coupling on the packer.

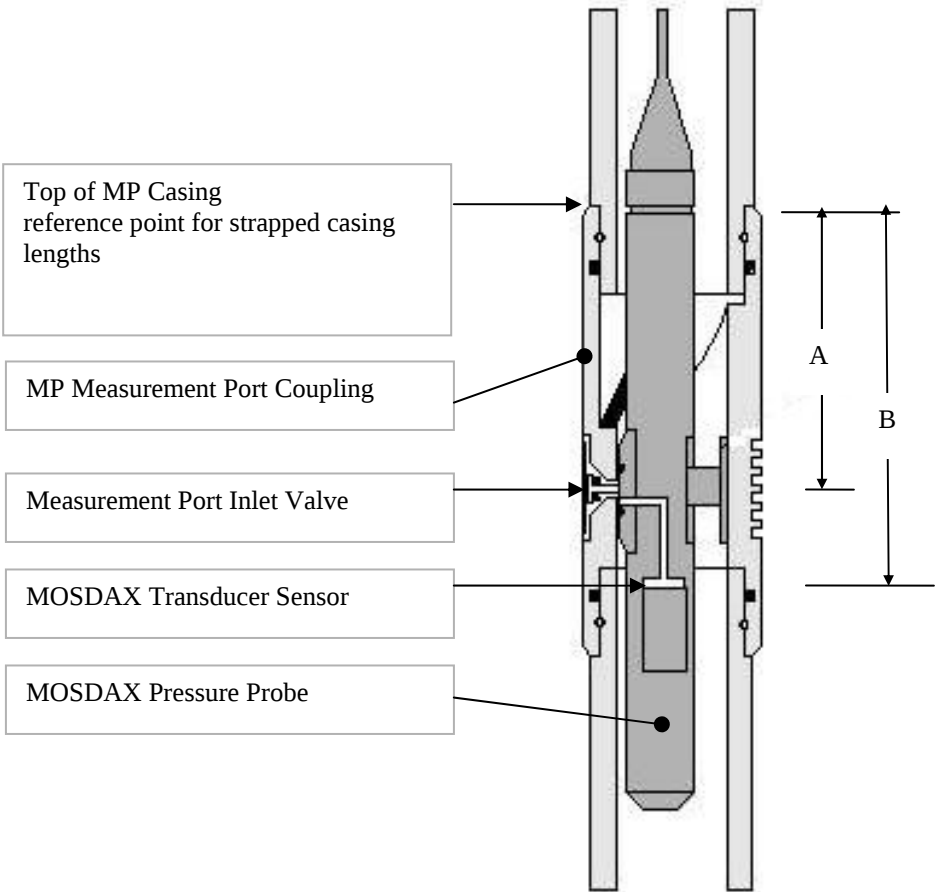
**** Measurement Port depth corrected for borehole plunge 70-deg from horizontal.

Monitoring zone dimensions are determined as described on the attached "Dimensions of Packer Seals and Monitoring Zones".

The position of a MOSDAX Transducer in a Measurement Port is illustrated in the attached "MOSDAX Transducer Position". This information may be used in calculating piezometric levels.

MOSDAX Transducer Position

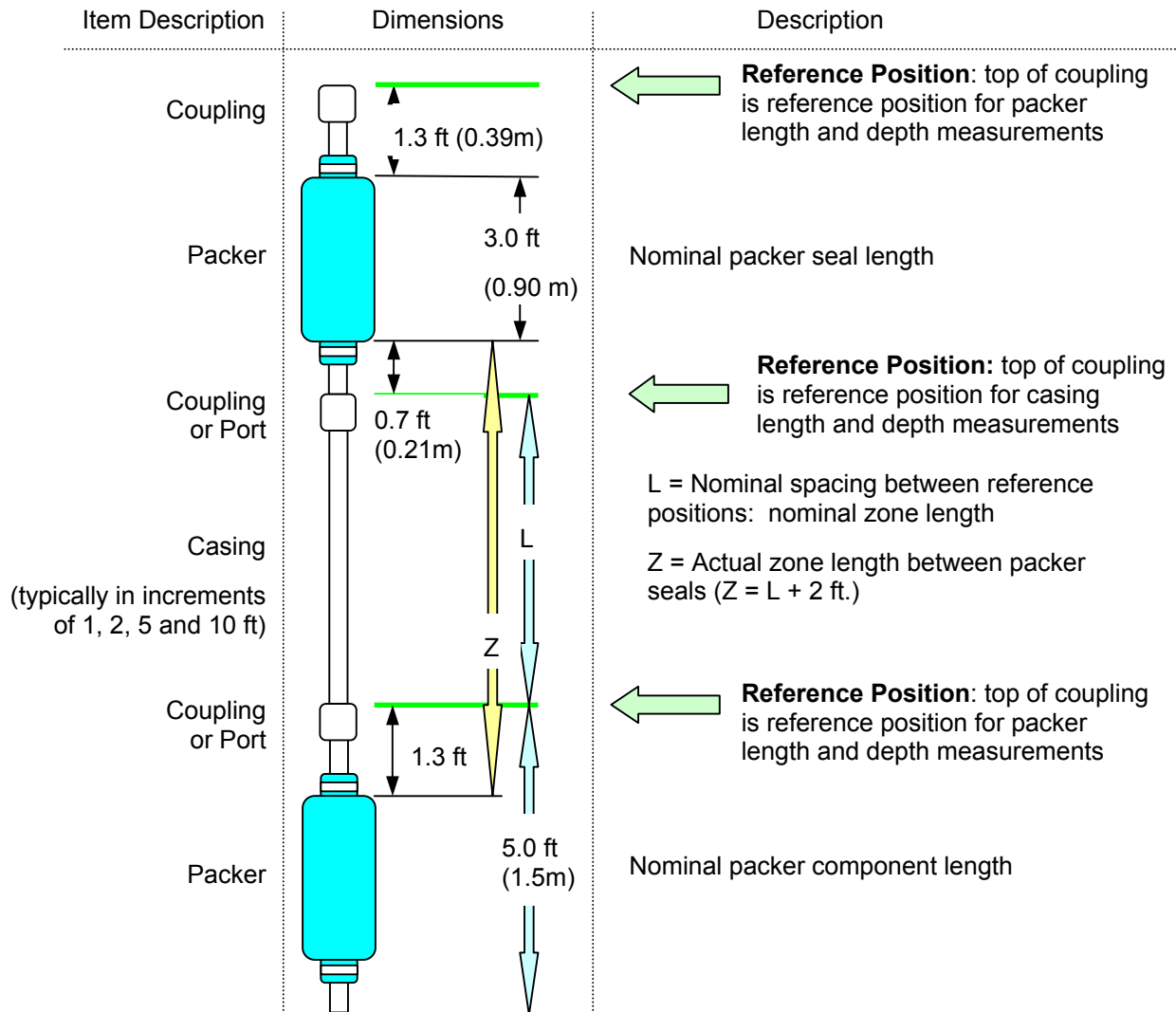
In an MP System Measurement Port Coupling



System	Measurement Port Type	A	B
Plastic MP38	0222, 0205	4.5" (114.3 mm)	6.5" (165.1 mm)

Dimensions of Packer Seals and Monitoring Zones

Westbay System – MP38



Discussion Points:

- The top of a coupling (Regular Coupling, Measurement Port or Pumping Port) is the reference point for describing nominal depths and nominal lengths. Actual positions of packer seals and zone lengths are determined with respect to the appropriate reference positions.
- Packer Position Example: A packer with a nominal depth of 50 ft (15.2m), will have a nominal packer seal position of 51.3 to 54.3 ft. (15.59 to 16.49m)
- Zone Length Example: A zone whose upper packer is at 50 ft (15.2m) and bottom packer is at 70 ft (21.3m) will have a nominal zone length of 15 ft (4.6m) and an actual zone length (between packer seals) of $15.0 + 1.3 + 0.7 = 17.0 \text{ ft.}$ ($4.6 + 0.39 + 0.2 = 5.19 \text{ m}$)
- Information on the position of Measurement Port Valve and MOSDAX Transducer sensor, used for detailed calculation of piezometric level measurements, are described separately.

APPENDIX

Monitoring Well NICO-10-291

Summary Casing Log	-3 pages
Pre-Inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (July 14, 2010)	-1 page
Figure 1, Pre-Inflation Piezometric Pressure Profile	-1 page
Post- Inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (July 15, 2010)	-1 page
Figure 2-3, Post-Inflation Piezometric Pressure Profile	-2 pages
Piezometric Pressure/Levels corrected for borehole angle	
Figure 4-6, Piezometric Pressure Profiles	-3 pages
Casing Installation Log (field copy)	-6 pages
Westbay System Packer Inflation Records	-7 pages

Summary Casing Log

Company: Fortune Minerals
Well: NICO-10-291
Site: NICO Development
Project: NICO

Job No: WB893
Author: ML

Well Information

Reference Datum:
Elevation of Datum: 0.00 m.
MP Casing Top: 0.00 m.
MP Casing Length: 194.14 m.

Borehole Depth: 199.00 m.
Borehole Inclination: 70-Deg
Borehole Diameter: 0.00 mm

Well Description:
MP38
Other References:

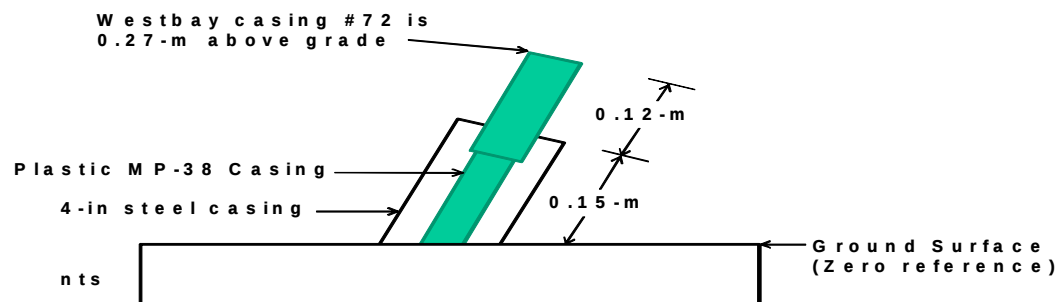
File Information

File Name: NICO.WWD
Report Date: Mon Aug 30 11:01:06 2010

File Date: Aug 10 11:35:06 2010

Sketch of Wellhead Completion

N I C O - 1 0 - 2 9 1 C o m p l e t i o n S k e t c h

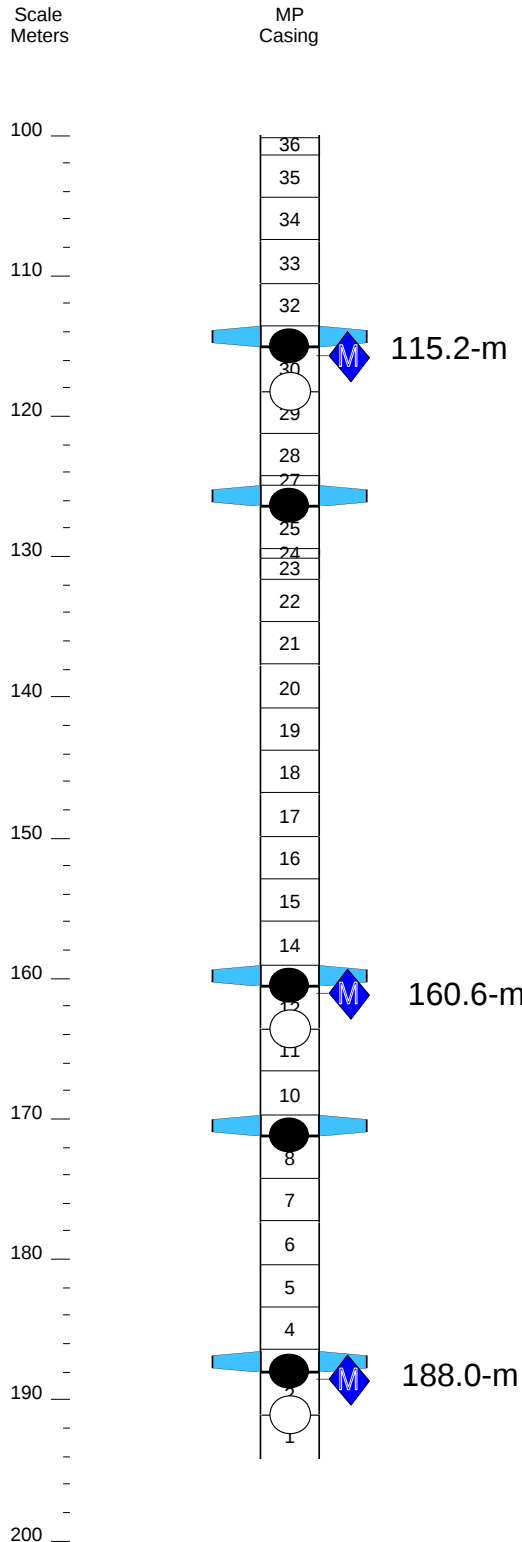
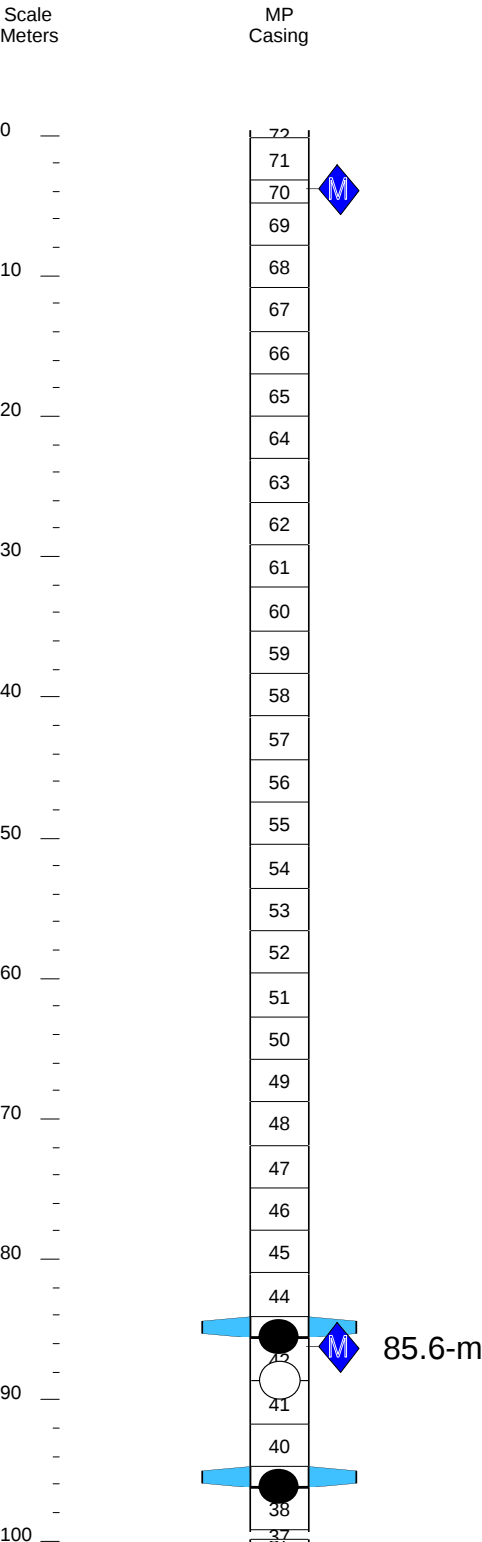


Legend

(Qty) MP Components (Library - WD Library 7/27/00)		Geology	Backfill/Casing
	(2) 0203 - MP38 End Cap		
	(4) 020102 - MP38 Casing 3 (2F/0.6M)		
	(58) 020110 - MP38 Casing 1 (10F/3M)		
	(3) 020105 - MP38 Casing 2 (5F/1.5M)		
	(7) 0238 - MP38 Packer 74mm (5F/1.5M)		
	(61) 0202 - MP38 Regular Coupling		
	(7) 0205 - MP38 Measurment Port		
	(4) 0224 - MP38 Pumping Port		
	(5) 0216 - Magnetic Location Collar		

Summary Casing Log
Fortune Minerals

Job No: WB893
Well: NICO-10-291





Pre-Inflation

Well No.:	NICO-10-2d1
Datum:	G.S.
Elev. G.S.:	0
Height of Westbay above G.S.:	0.36 m
Elev. top of Westbay Casing:	0
Reference Elevation:	0
Borehole angle:	70-Deg

Probe Type: Sampler
Serial No.: ENS1057
Probe Range: 500ps
Westbay Casing Type: MP38
Sampler Valve Position: closed

Date: July 14/10
Client: Fortune Minerals
Job No.: WB 893
Location: Nico
Weather: Rainy / warm
Operator: M. Leisard

Ambient Reading (P_{atm}) (pressure, temperature, time)
 re 14.03 ps Finish: 14.13 ps
2762 °C 8.01 s
16.0 s 16.4 s

P_{atm} 14.03 psi

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz)

[illegible]

Notes: $w = 0.4335 \text{ psi/ft}$ (1.422 psi/m) of H_2O

Dz = piezometric level in zone

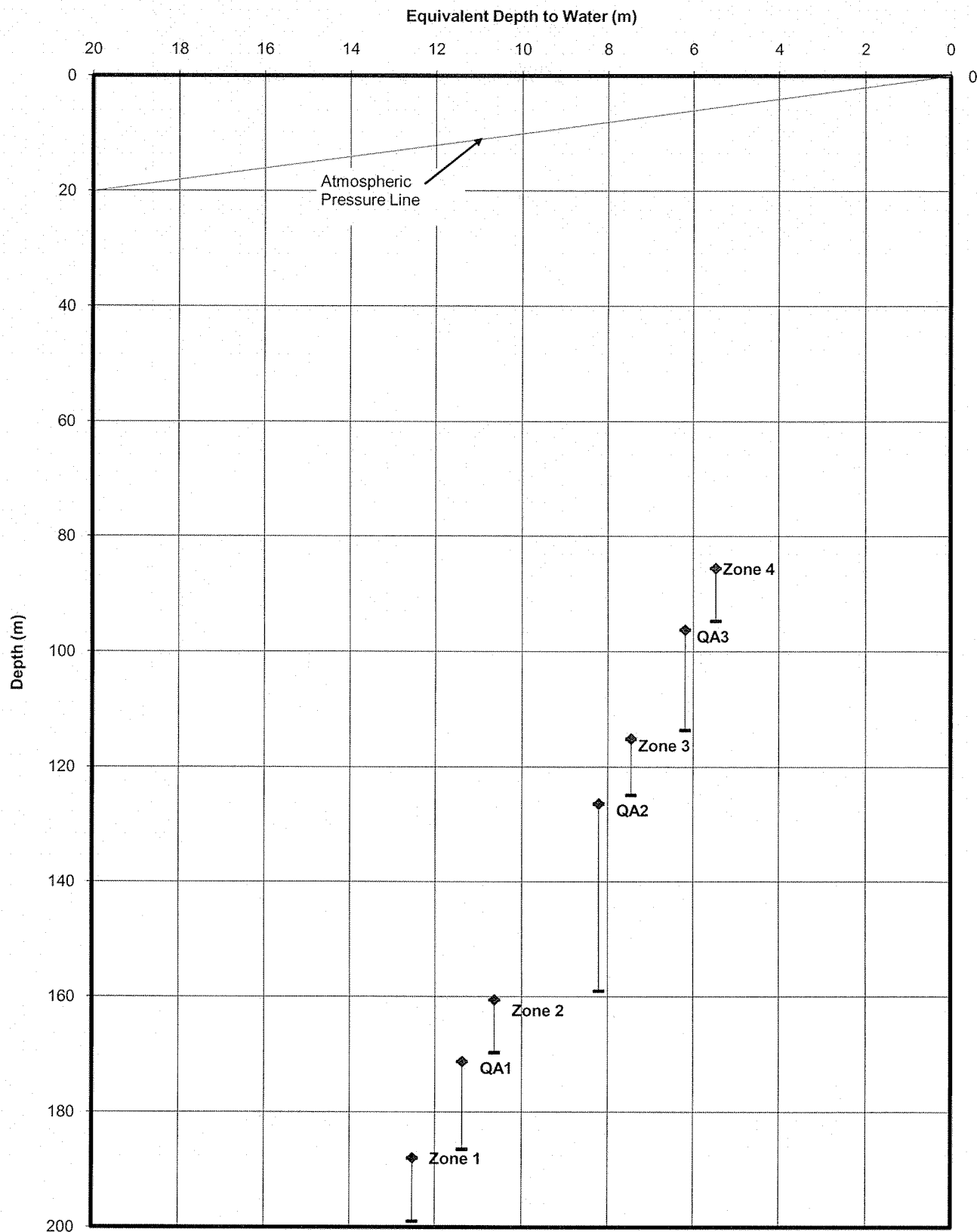
Patm = atmospheric pressure

H = pressure head of water in zone

D_p = true depth of measurement port

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 14, 2010
 Comments: Pre-Inflation Profile
 Not corrected for borehole angle.



Client: Fortune Minerals
 Site: NICO
 Datum: Ground Surface

Figure 1

Plot By: ML Date: 8/17/10
 Checked By: AB Date: 8/30/10
 Westbay Project: WB893

Post-Inflution
Field Data and Calculation Sheet

Well No.: NTCO-60-291

Datum: 65

Elev. G.S.: 0

Height of Westbay above G.S.: 0.27-m

Elev. top of Westbay Casing: 0

Reference Elevation: 6

Borehole angle: 70-Deg

Probe Type: *Sampler*

Serial No.: EMS 1057

Probe Range: 5005

Westbay Casing Type: MP38

Sampler Valve Position: Closed

Date: July 15/16

Client: Fortune Mobile

Job No. WB 902

Location: AECG

Weather: Hot / Moist

Operator: ML/TM

Ambient Reading (P_{atm}) (pressure, temperature, time)

Start: Pressure
19.05 05 Finish: 14.03

Temp	28.67°C	67.9
------	---------	------

Time 1:38 am 2:28 pm

P_{atm} 14.05 psi

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

[illegible]

Notes:

 $w = 0.4335 \text{ psi/ft (1 422 psi/m) of H}_2\text{O}$

DZ = piezometric level in zone

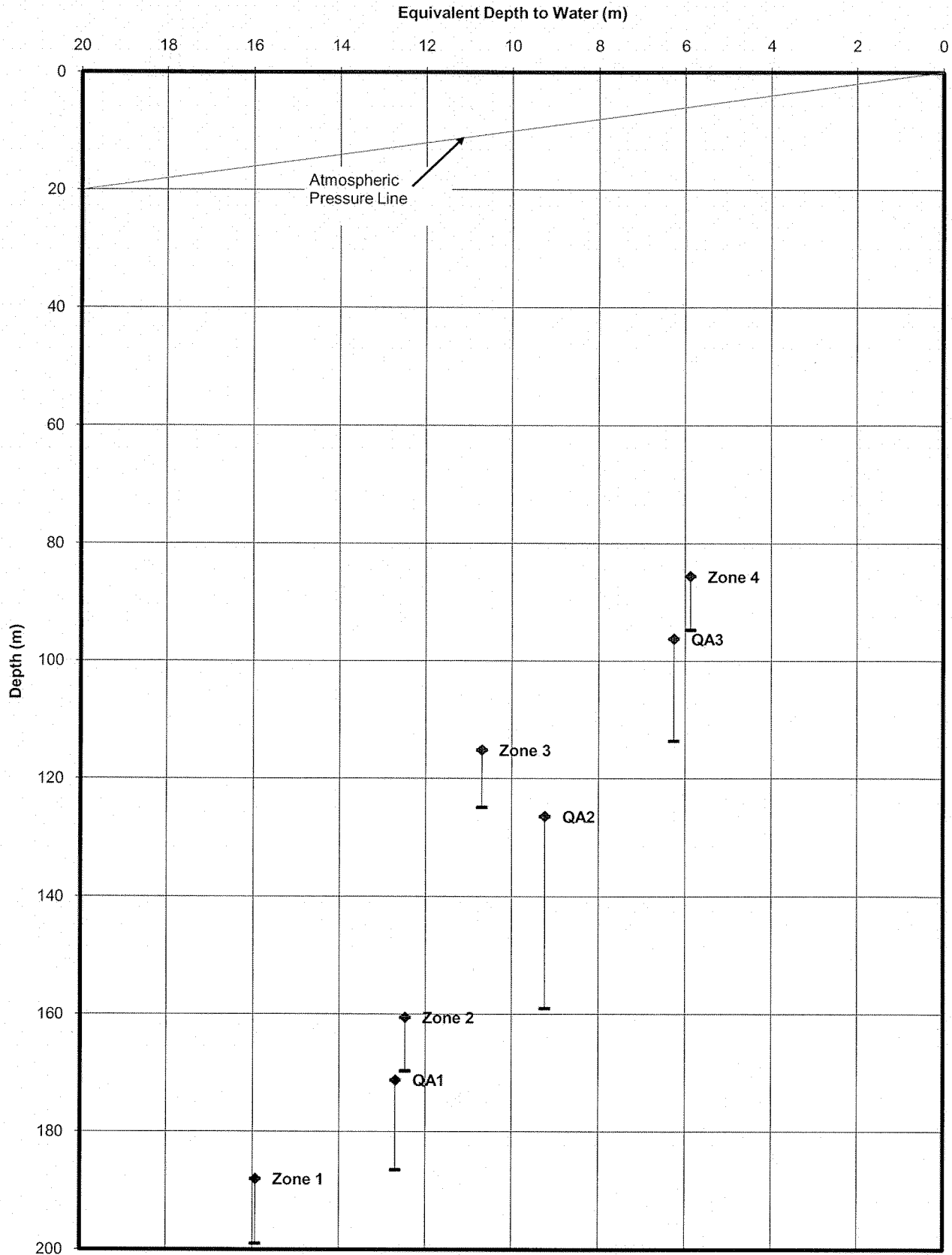
P_{atm} = atmospheric pressure

H = pressure head of water in zone

 D_0 = true depth of measurement point

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 15, 2010
 Comments: Post-Inflation Profile
 Not corrected for borehole angle.



Client: Fortune Minerals
 Site: NICO
 Datum: Ground surface

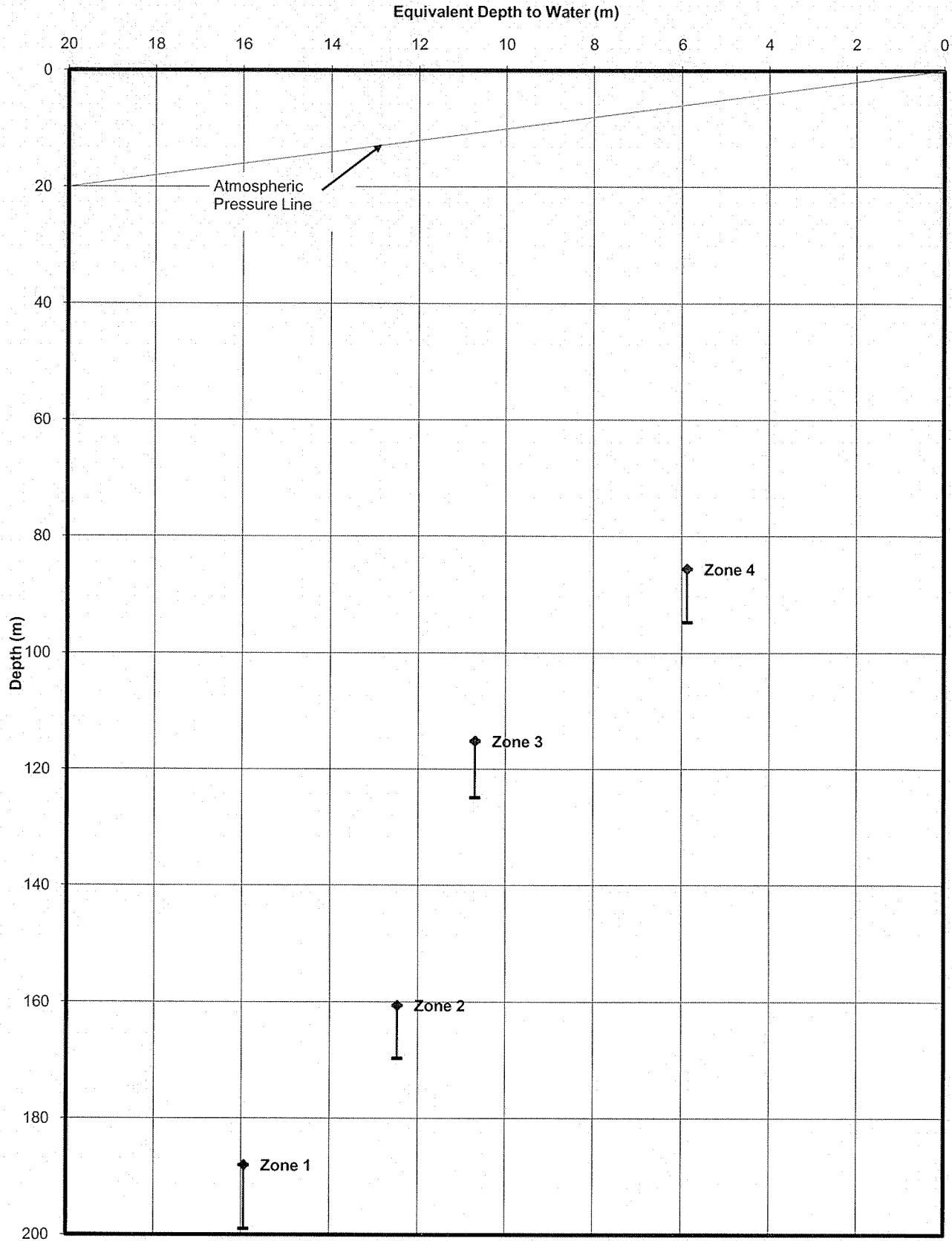
Figure 2

Plot By: WZ Date: 8/17/10
 Checked By: AB Date: 8/30/10
 Westbay Project: WB893

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 15, 2010
 Comments: Post-Inflation Profile

Monitoring zones only. Not corrected for borehole angle.



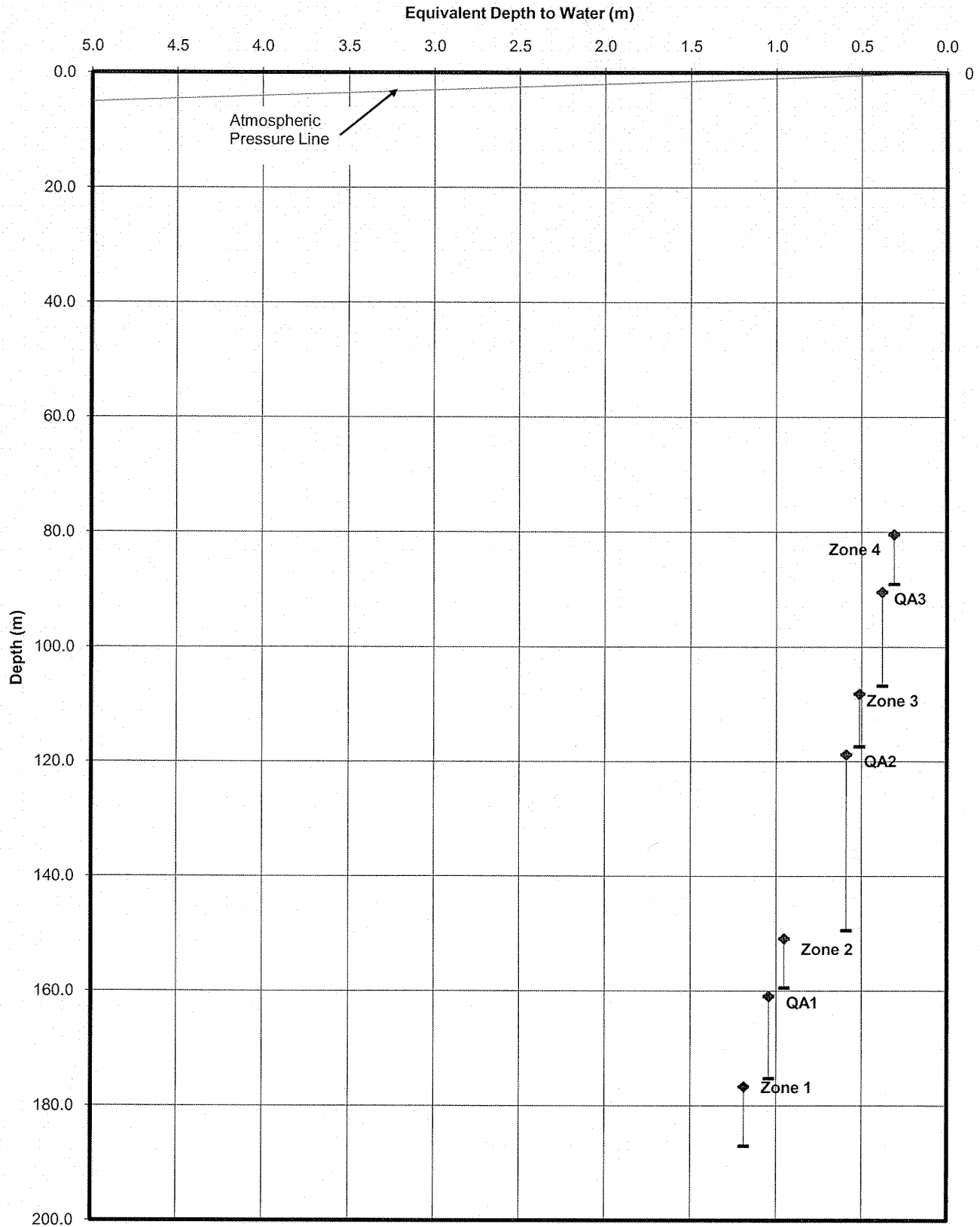
Client: Fortune Minerals
 Site: NICO
 Datum: Ground Surface

Figure 3

Plot By: ny Date: 8/17/10
 Checked By: AB Date: 8/24/10
 Westbay Project: WB893

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 14, 2010
 Comments: Pre-Inflation Profile
 Corrected for 70-Deg from horizontal borehole angle.



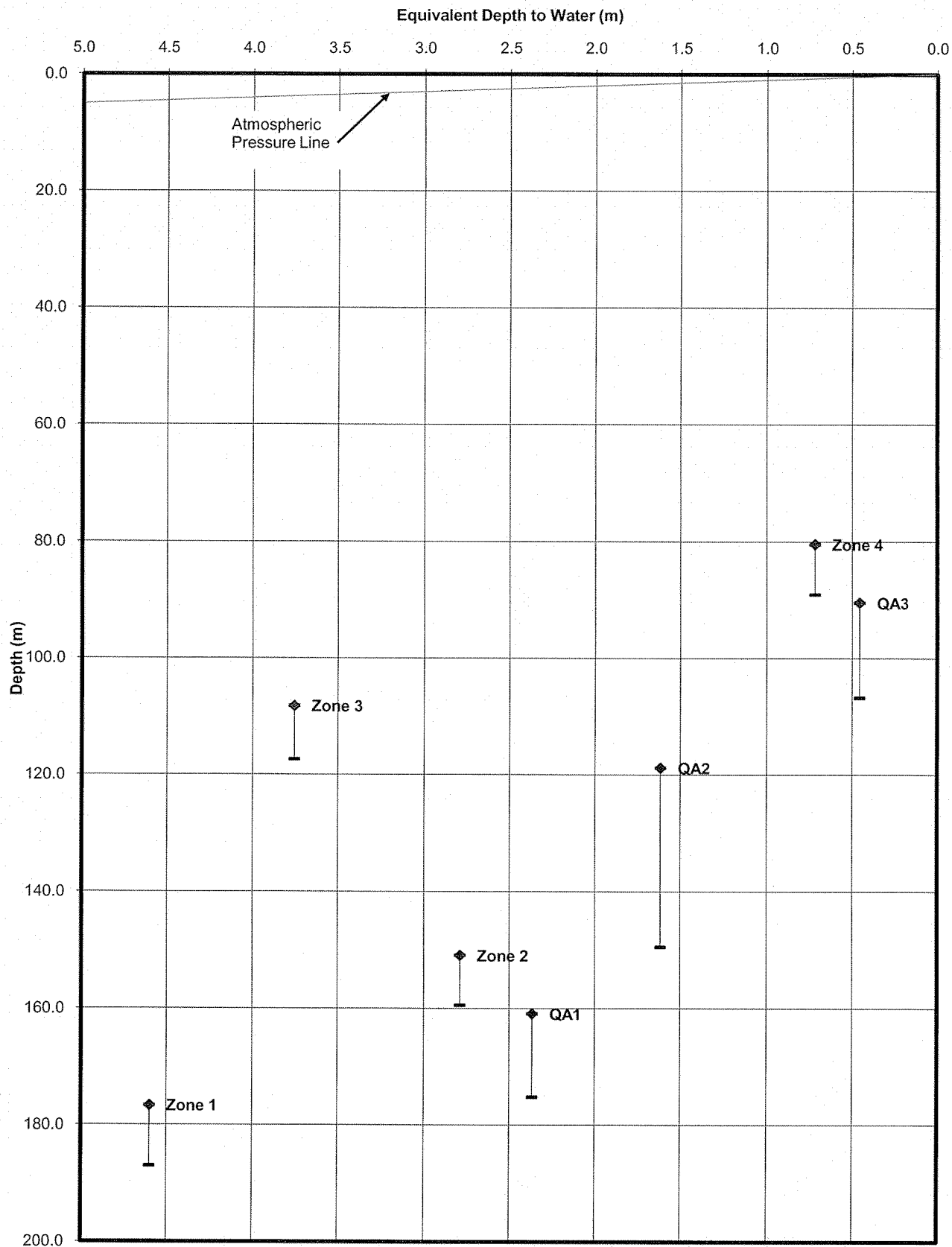
Client: Fortune Minerals
 Site: NICO
 Datum: Ground Surface

Figure 4

Plot By: ML Date: 8/10/10
 Checked By: Date:
 Westbay Project: WB893

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 15, 2010
 Comments: Post-Inflation Profile
 Corrected for 70-Deg from horizontal borehole angle



Client: Fortune Minerals
 Site: NICO
 Datum: Ground surface

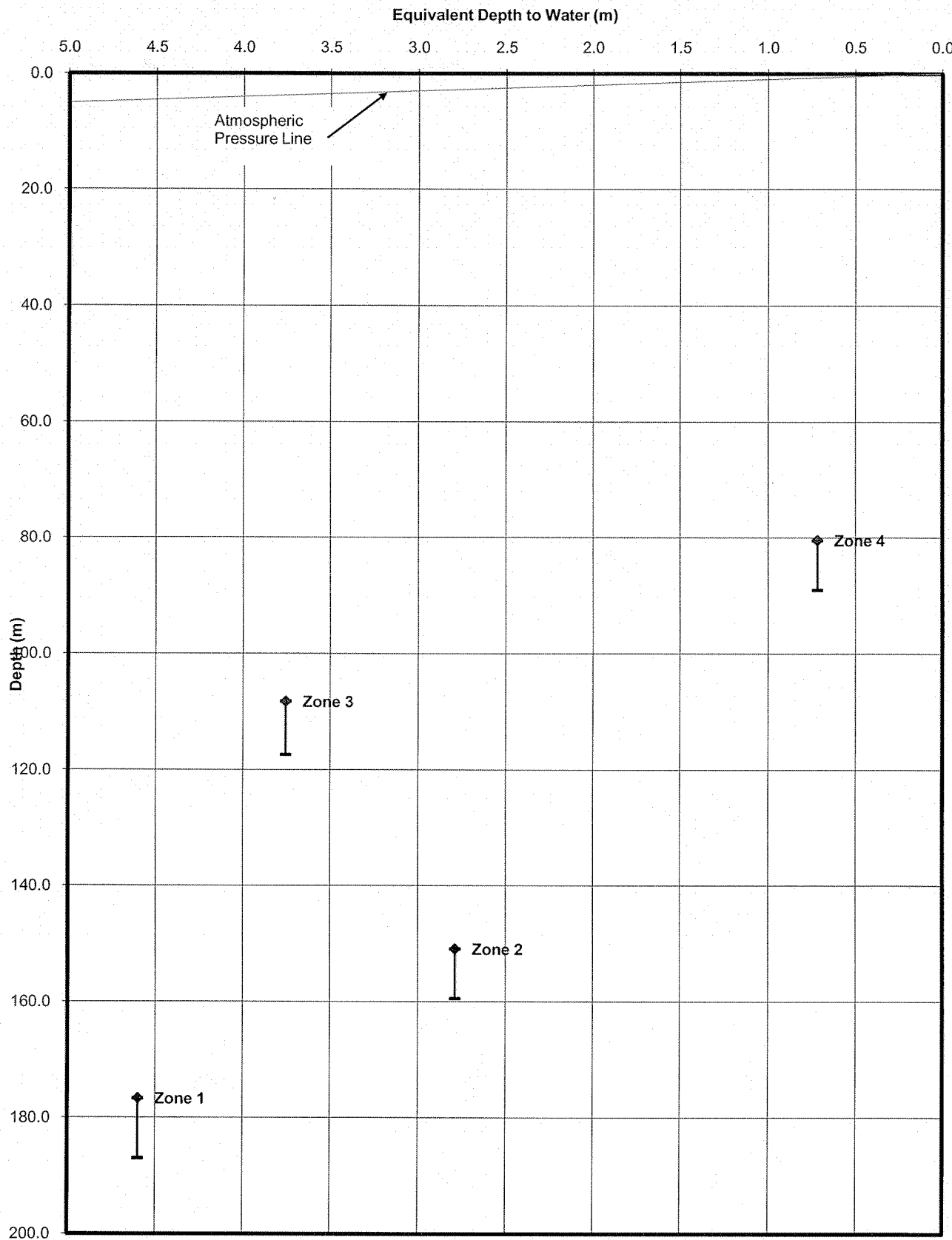
Figure 5

Plot By: MJ Date: 8/10/10
 Checked By: _____ Date: _____
 Westbay Project: WB893

Piezometric Profile
Monitoring Well: NICO-10-291

Profile Date: July 15, 2010
 Comments: Post-Inflation Profile

Monitoring zones only. Corrected for 70-Deg from horizontal borehole angle



Client: Fortune Minerals
 Site: NICO
 Datum: Ground Surface

Figure 6

Plot By: ML Date: 8/17/10
 Checked By: Date:
 Westbay Project: WB893

Casing Installation Log

Company: Fortune Minerals
Well: NICO-10-291
Site: NICO Mine ^{ML}
Project:

Job No: WB893
Author: ML

Well Information

Reference Datum:
Elevation of Datum: 0.00 m.
MP Casing Top: 0.00 m.
MP Casing Length: 194.14 m.

Borehole Depth: 199.00 m.
Borehole Inclination: Vertical
Borehole Diameter: 0.00 mm

Well Description:
MP38
Other References:

File Information

File Name: NICO_D1.WWD
Report Date: Fri Jul 09 09:24:25 2010

File Date: Jul 09 08:18:28 2010

Comments

Filter socks to be used. *JML*
Zero reference is ground surface. *JML*

Log Information

Borehole condition confirmed.
MP well design & preparation.
MP well design checked.
MP well and borehole approved to install.

(method)	Date:
By: <i>Mark Farnand</i>	Date: <i>July 9/10</i>
By: <i>JML</i>	Date: <i>July 13/10</i>
By: <i>JML</i>	Date: <i>July 13/10</i>

Legend

(Qty) MP Components (Library - WD Library 7/27/00)		Geology	Backfill/Casing
	(2) 0203 - MP38 End Cap		
	(4) 020102 - MP38 Casing 3 (2F/0.6M)		
	(58) 020110 - MP38 Casing 1 (10F/3M)		
	(3) 020105 - MP38 Casing 2 (5F/1.5M)		
	(7) 0238 - MP38 Packer 74mm (5F/1.5M)		
	(61) 0202 - MP38 Regular Coupling		
	(7) 0205 - MP38 Measurment Port		
	(4) 0224 - MP38 Pumping Port		
	(5) 0216 - Magnetic Location Collar		

Casing Installation Log Fortune Minerals

Job No: WB893
Well: NICO-10-291

Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbers
0	72	☒		
	71	☒	020110 - MP38 Casing 1 (10F/3M)	
	70	☒	020105 - MP38 Casing 2 (5F/1.5M)	
	69	☒	020110 - MP38 Casing 1 (10F/3M)	
10	68	☒	020110 - MP38 Casing 1 (10F/3M)	
	67	☒	020110 - MP38 Casing 1 (10F/3M)	
	66	☒	020110 - MP38 Casing 1 (10F/3M)	
	65	☒	020110 - MP38 Casing 1 (10F/3M)	
20	64	☒	020110 - MP38 Casing 1 (10F/3M)	
	63	☒	020110 - MP38 Casing 1 (10F/3M)	
	62	☒	020110 - MP38 Casing 1 (10F/3M)	
30	61	☒	020110 - MP38 Casing 1 (10F/3M)	
	60	☒	020110 - MP38 Casing 1 (10F/3M)	
	59	☒	020110 - MP38 Casing 1 (10F/3M)	
40	58	☒	020110 - MP38 Casing 1 (10F/3M)	
	57	☒	020110 - MP38 Casing 1 (10F/3M)	
	56	☒	020110 - MP38 Casing 1 (10F/3M)	
50	55	☒	020110 - MP38 Casing 1 (10F/3M)	

Finish lowering at 3:12 pm
July 14, 2010

Aw- Added water to
Westbay Casing to
Counter buoyancy

Aw

Casing Installation Log Fortune Minerals

Job No: WB893
Well: NICO-10-291

Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbers
50				
	54	☒	020110 - MP38 Casing 1 (10F/3M)	
	53	☒	020110 - MP38 Casing 1 (10F/3M)	
	52	☒	020110 - MP38 Casing 1 (10F/3M)	
60	51	☒	020110 - MP38 Casing 1 (10F/3M)	
	50	☒	020110 - MP38 Casing 1 (10F/3M)	
	49	☒	020110 - MP38 Casing 1 (10F/3M)	
	48	☒	020110 - MP38 Casing 1 (10F/3M)	
70	47	☒	020110 - MP38 Casing 1 (10F/3M)	
	46	☒	020110 - MP38 Casing 1 (10F/3M)	
	45	☒	020110 - MP38 Casing 1 (10F/3M)	
80	44	☒	020110 - MP38 Casing 1 (10F/3M)	
	43	☒	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	
	42	☒	020110 - MP38 Casing 1 (10F/3M)	
90	41	☒	0224 - MP38 Pumping Port	
	40	☒	020110 - MP38 Casing 1 (10F/3M)	
	39	☒	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	
	38	☒	020110 - MP38 Casing 1 (10F/3M)	
100	37	☒	020102 - MP38 Casing 3 (2F/0.6M)	

Aw

FS- filter sock installed

Aw - Added water to
westbay casing to
counter buoyancy.

Aw

17349-190
6124
8021

17354-155
6127

Casing Installation Log Fortune Minerals

Job No: WB893
Well: NICO-10-291

Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbers
100	36	☒	020105 - MP38 Casing 2 (5F/1.5M)	
	35	☒	020110 - MP38 Casing 1 (10F/3M)	
	34	☒	020110 - MP38 Casing 1 (10F/3M)	
	33	☒	020110 - MP38 Casing 1 (10F/3M)	
110	32	☒	020110 - MP38 Casing 1 (10F/3M)	
	31	☒	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	17355-140 6122
	30	☒	020110 - MP38 Casing 1 (10F/3M)	
	29	☒	0224 - MP38 Pumping Port	8020
120	28	☒	020110 - MP38 Casing 1 (10F/3M)	
	27	☒	020102 - MP38 Casing 3 (2F/0.6M)	
	26	☒	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	17350-145 6125
	25	☒	020110 - MP38 Casing 1 (10F/3M)	
130	24	☒	020102 - MP38 Casing 3 (2F/0.6M)	
	23	☒	020105 - MP38 Casing 2 (5F/1.5M)	
	22	☒	020110 - MP38 Casing 1 (10F/3M)	
	21	☒	020110 - MP38 Casing 1 (10F/3M)	
	20	☒	020110 - MP38 Casing 1 (10F/3M)	
140	19	☒	020110 - MP38 Casing 1 (10F/3M)	
	18	☒	020110 - MP38 Casing 1 (10F/3M)	
	17	☒	020110 - MP38 Casing 1 (10F/3M)	
150				

Job No: WB893
Well: NICO-10-291

Start lowering - 11:00 am / July 14, 2010

(c) Westbay Instruments Inc. 2000

Fri Jul 09 09:25:11 2010

Joint test tool - 200 psi.
Inflation tool - 470 psi.

162.37-Ft at 9:00 pm

Westbay Casing
is water tight.
Mark Leland.

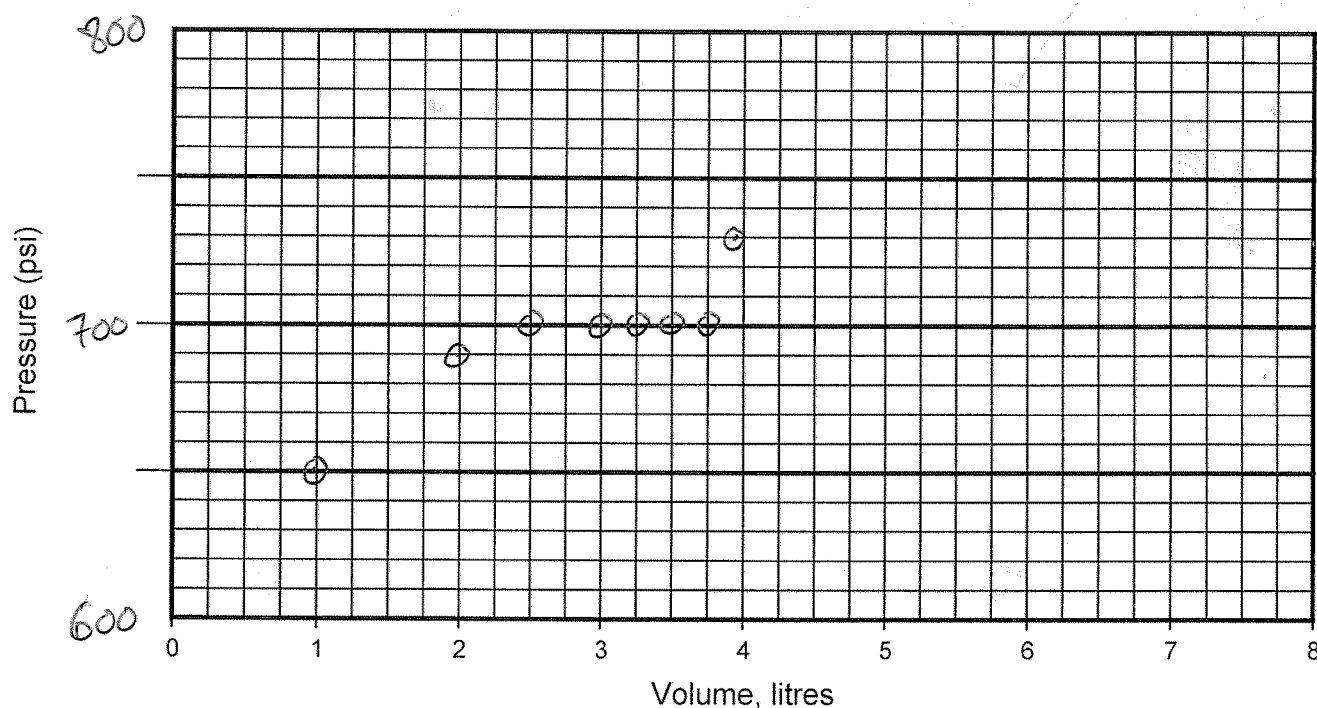


Sheet 1 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB893 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. 1, comp 3 SN# 17356 Depth (ft (m)): 186.5 Inflation Tool No.: TFW3197
 Packer Valve Pressure, P_V: 145 psi Final Line Pressure, P_L: 738 psi Tool Pressure, P_T: 470 psi
 Borehole Water Level: 0.5 (ft (m)) = 0 psi (P_W)
 Calculated Packer Element Pressure, P_E = P_L + P_W - P_V - P_T = 115 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	3.6	
Pressure, psi	650	690	700	700	700	700	700	730	0	
Volume, litres										
Pressure, psi										



Comments: Packer #1

Time - 8:48 am

Target ~ 750 psi

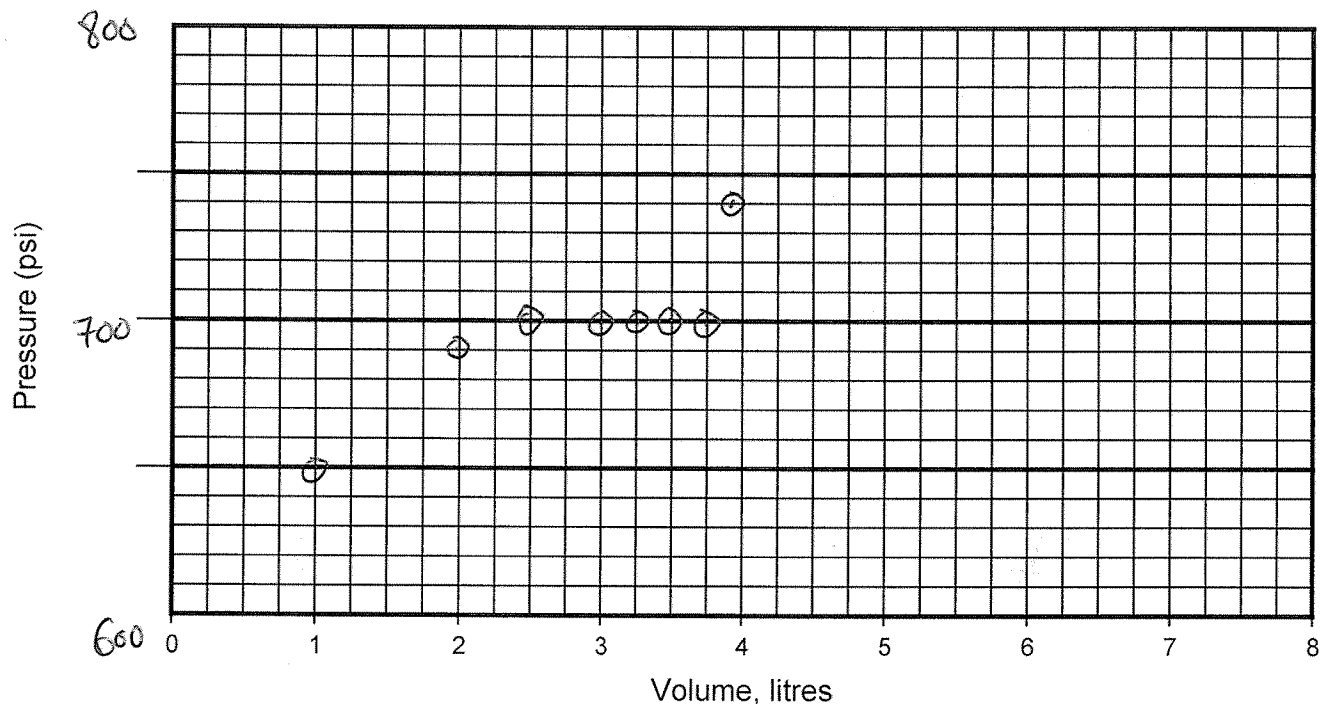


Sheet 2 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB 893 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. 2, comp 9 SN# 17352 Depth (ft / ϕ): 169.7 Inflation Tool No.: TIW 3197
 Packer Valve Pressure, P_V : 145 psi Final Line Pressure, P_L : 740 psi Tool Pressure, P_T : 470 psi
 Borehole Water Level: 0.5 (ft / ϕ) = 0 psi (P_W)
 Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 125 ~~470~~ psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	3.5	
Pressure, psi	650	690	700	700	700	700	700	740	ϕ	
Volume, litres										
Pressure, psi										



Comments: Packer # 2

Time - 9:03 am

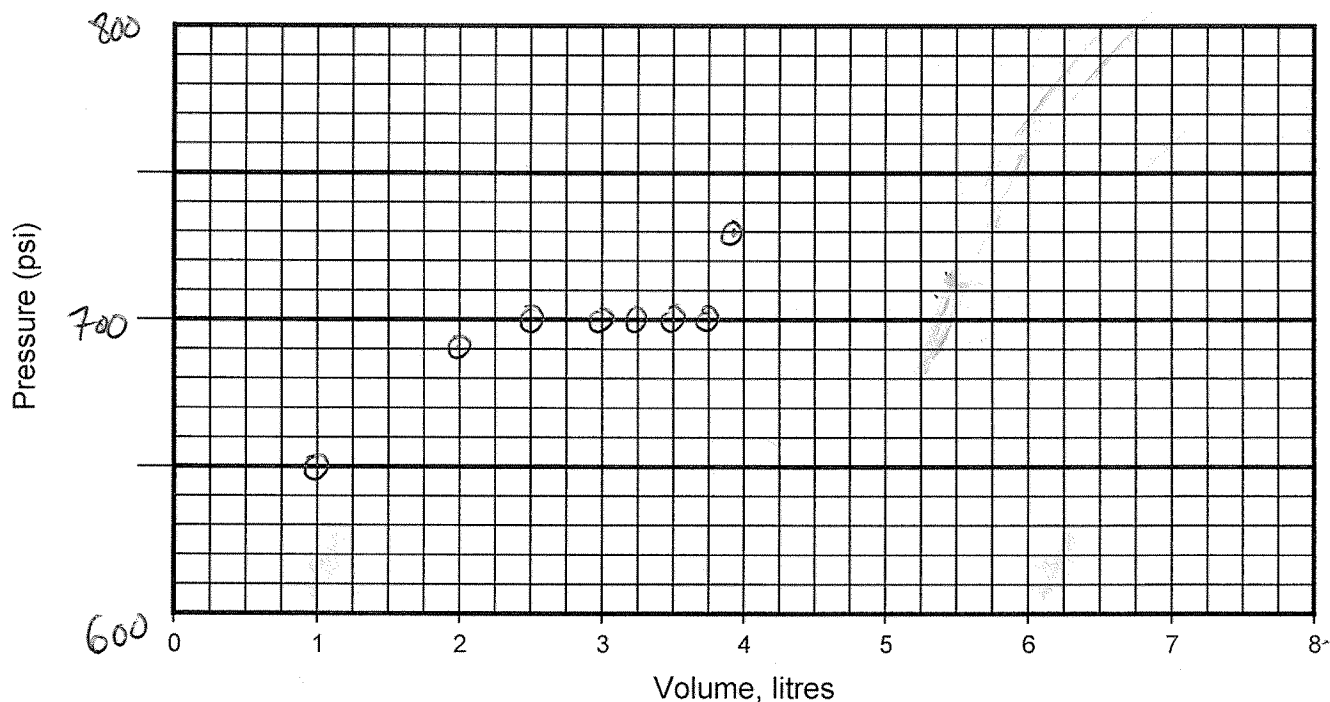


Sheet 3 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB893 Well No.: NFCO-10-291
 Location: NFCO Completed by: M. Lossard Date Inflated: July 15/10
 Packer No. 3 comp 138 SN# 17351 Depth (ft / m): 159.0 Inflation Tool No.: TFW 3197
 Packer Valve Pressure, P_V : 145 psi Final Line Pressure, P_L : 736 psi Tool Pressure, P_T : 470 psi
 Borehole Water Level: 0.5 (ft / m) = 0 psi (P_W)
 Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 115 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	3.5	
Pressure, psi	650	690	700	700	700	700	700	730	φ	
Volume, litres										
Pressure, psi										



Comments: Packer # 3

Time - 9:17am

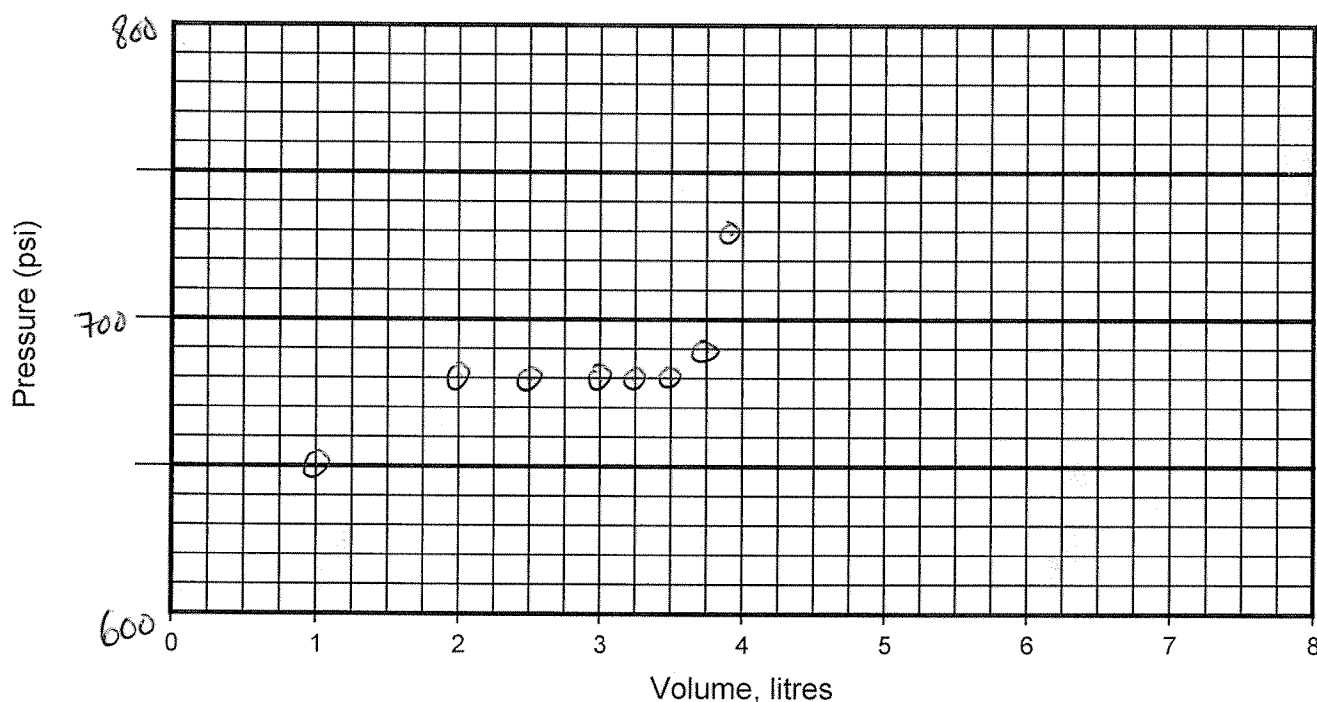


Sheet 4 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB 893 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. 4xcomp 26 SN# 17350 Depth (ft / ϕ): 124.9 Inflation Tool No.: TFW 3197
 Packer Valve Pressure, P_V : 145 psi Final Line Pressure, P_L : 736 psi Tool Pressure, P_T : 470 psi
 Borehole Water Level: 0.5 (ft / ϕ) = 0 psi (P_W)
 Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 115 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	3.5	
Pressure, psi	650	680	680	680	680	680	690	730	ϕ	
Volume, litres										
Pressure, psi										



Comments: Packer # 4 Time - 9:35 am

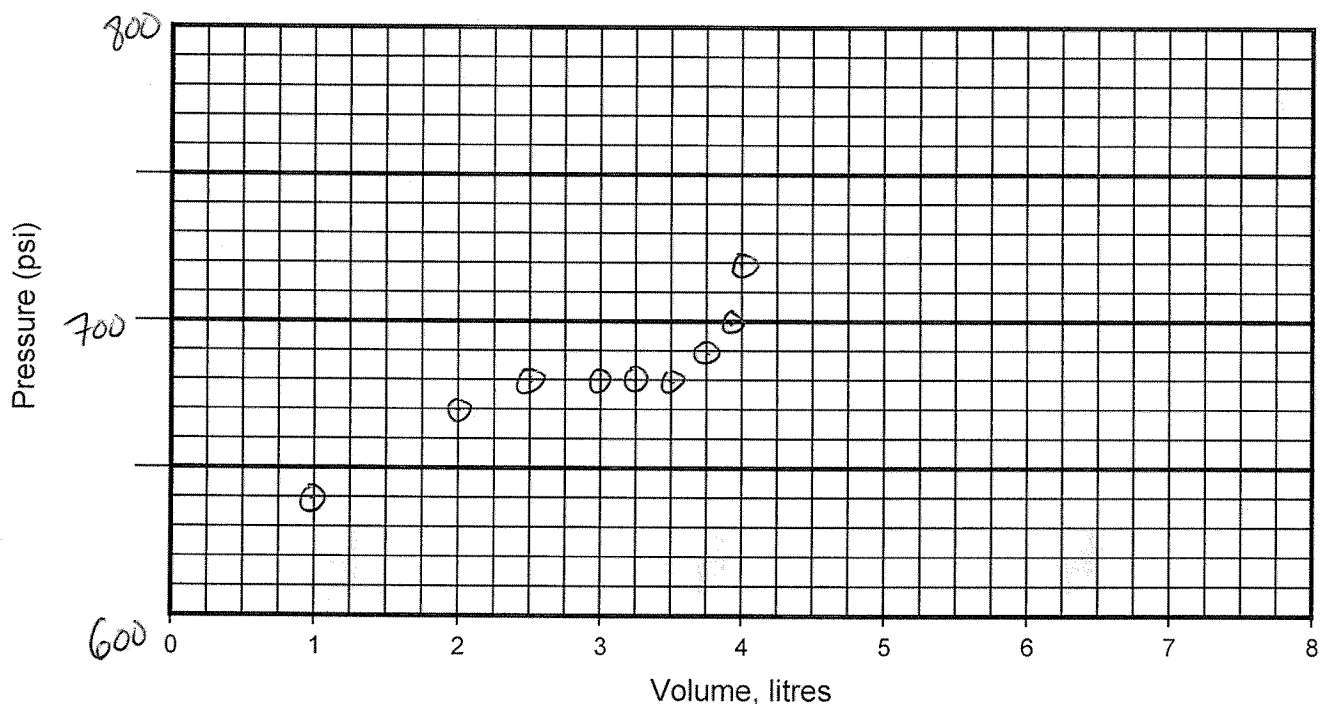


Sheet 5 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB 893 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. S_{comp} 31 SN# 17355 Depth (ft/m): 113.6 Inflation Tool No.: TIW 3197
 Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 720 psi Tool Pressure, P_T: 970 psi
 Borehole Water Level: 0.5 (ft/m) = 0 psi (P_W)
 Calculated Packer Element Pressure, P_E = P_L + P_W - P_V - P_T = 110 ~~470~~ psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	4.0	3.6
Pressure, psi	640	670	680	680	680	680	690	700	720	Ø
Volume, litres										
Pressure, psi										



Comments: Packer # 5

Time - 9:50 am

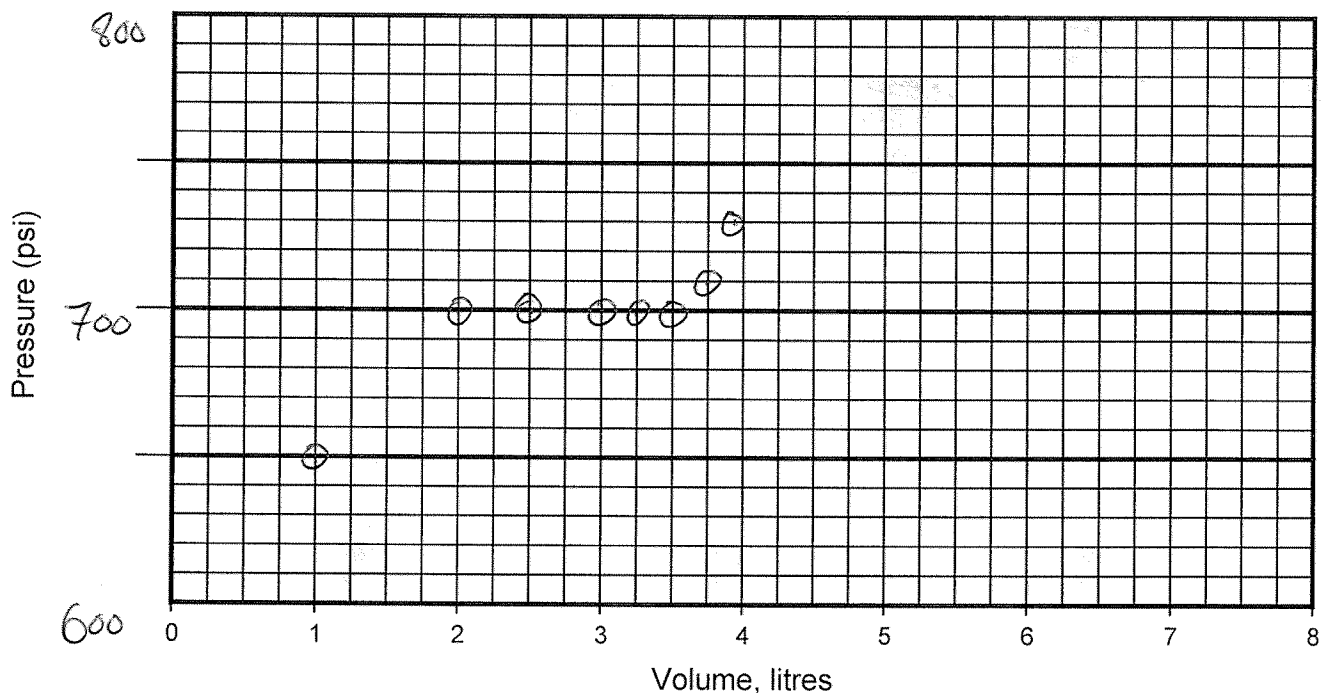


Sheet 6 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB 893 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. 6, Comp 39 SN#17354 Depth (ft / m): 94.7 Inflation Tool No.: TIW3197
 Packer Valve Pressure, P_V : 155 psi Final Line Pressure, P_L : 730 psi Tool Pressure, P_T : 470 psi
 Borehole Water Level: 0.5 (ft / m) = 0 psi (P_W)
 Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 105 psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	3.5	
Pressure, psi	650	700	700	700	700	700	710	730	Ø	
Volume, litres										
Pressure, psi										



Comments: Packer # 6

Time - 10:07 am

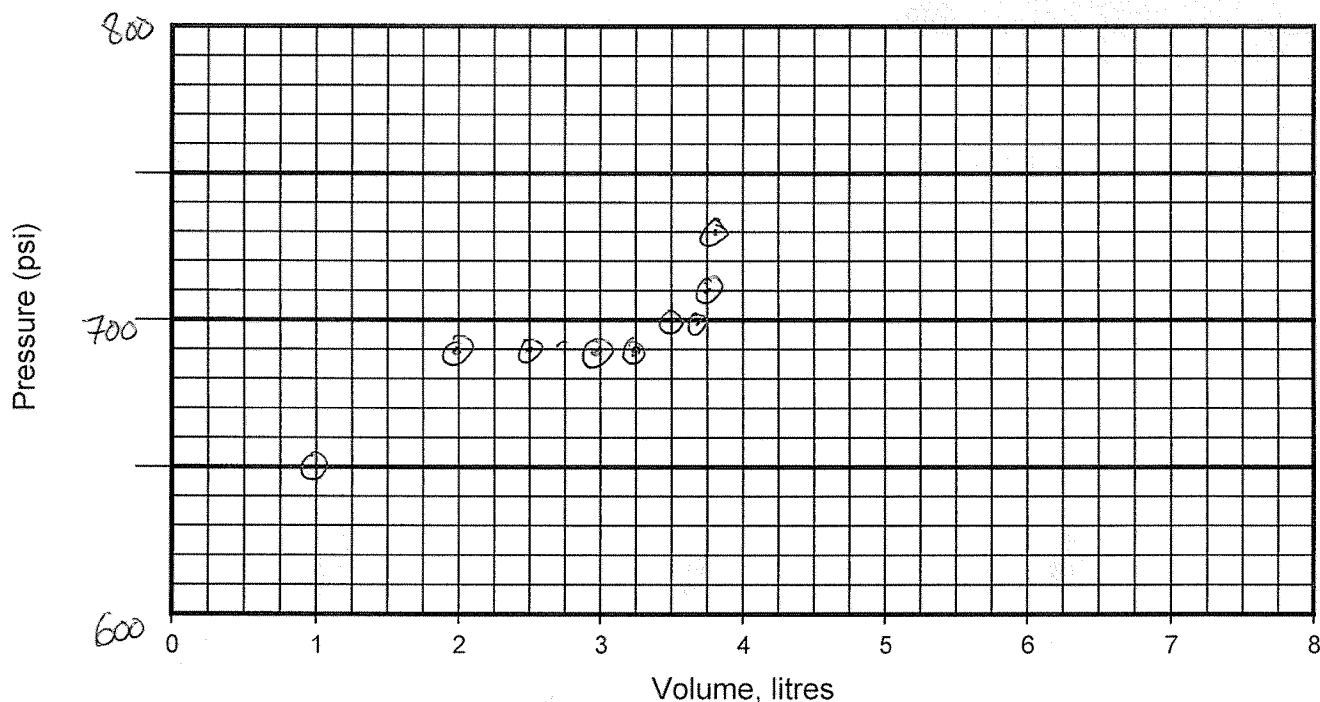


Sheet 7 of 7

Westbay Packer Inflation Record

Project: Fortune Minerals Project No.: WB 898 Well No.: NICO-10-291
 Location: NICO Completed by: M. Lessard Date Inflated: July 15/10
 Packer No. 7comp 43 SN# 17349 Depth (ft/m): 84.1 Inflation Tool No.: TIW 3147
 Packer Valve Pressure, P_V : 140 psi Final Line Pressure, P_L : 730 psi Tool Pressure, P_T : 470 psi
 Borehole Water Level: 0.5 (ft/m) = 0 psi (P_W)
 Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 120 ~~470~~ psi

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.7	3.75	3.8	3.5
Pressure, psi	650	690	690	690	690	700	700	710	720	Ø
Volume, litres										
Pressure, psi										



Comments: Packer # 7

Time - 10:25 am

FORTUNE MINERALS LIMITED

DIAMOND DRILL HOLE SUMMARY

HOLE NUMBER: NICO-10-291	
COMPANY	Fortune Minerals Limited
PROPERTY	NICO
CLAIM	
ZONE	
FIELD GRID LOCATION	Line
SURVEY LOCATION	
AZIMUTH	
DIP	
SPERRY SUN TESTS	
CASING	
CORE SIZE	
LENGTH OF HOLE	
DRILL CONTRACTOR	Connors Drilling Limited
DATE STARTED	
DATE COMPLETED	
LOGGED BY	
CORE STORAGE	

[illegible]

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 1 of 11				
				Date: 18-Jun-10				Location: Line 25+50W 3+58N												
				Logger: Greg Robinson				Dip: 70				Az: 200								
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay	Check	Cobalt			
FROM	TO	From	To		Detailed Description	Type	Angle	Metres	Type	Angle	%	From	To	Sample #				C/S/B	From	To
0.00	4.00m			Overburden																
4.00	17.53			Biotite-amphibole-altered subarkosic wacke. Fine- to medium-grained matrix with	JO	50	5.73													
				variable quartz and biotite, with minor chlorite. Locally amphibole comprises up to	JO	42	8.86	Py		3-4	4.13	4.23								
				10% composition. Unit is greyish with a subtle hue of green. Weak schistosity due	JO	64	10.50	Hem		10	5.68	10.30								
				to grain alignment of biotite flakes. Intervals of unit have been altered byincipient				Hem		10	11.37	15.13								
				patches of hematite alteration with variable intensity.				Py/Aspy		2	14.90									
		Need to vary		Carbonate stringers closely parallel unit schistosity. Silphide mineralization is						15	15.87	17.53								
				restricted to the top of unit within strongly hematized patch. Silicification is localized	VN	40	12.29													
				proximal to lower contact of unit. Sharp downhole contact with porphyry.	VN	25	12.52	FZ			6.69	16.00								
		5.68	10.30	Penetrative hematite alteration.	JO	48	13.00													
		11.37	15.13	Penetrative hematite alteration.																
		12.26	12.36	Carbonate stringers parallel to schistosity.																
		15.87	17.53	Penetrative hematite alteration.	CA	42	17.53													
17.53	19.08			FELDSPAR-AMPHIBOLE PORPHYRY				Hem		15	17.53	17.96								
				Aphanitic grey-black matrix with 10-15%, 1-5 mm subrounded to subangular feldspar	JO	36	17.93													
				phenocrysts. Fine amphibole phenocrysts <1mm to 2mm, 8-10%. Porphyry is																
				non-magnetic with trace/rare fine disseminations of arsenopyrite. Patches of intense																
				pervasive hematite alteration of matrix and feldspar phynocrysts gradational from																
				uphole contact through upper 45cm of unit. Amphibole phenocrysts within alteration																
				zone are elongated, indicating potential shear.											C	18.08	19.08			
				Chloritic along joints crosscutting porphyry. Downhole contact is sharp.	CA	20	19.08													
		17.53	17.98	Hematite-altered feldspar-amphibole porphyry.																
19.09	31.19			MODERATELY MINERALIZED BIOTITE-AMPHIBOLE+/- MAGNETITE SCHIST				Aspy-Po		2-3	19.08	19.22			C	19.08	20.08			
				Fine-grained olive-green to black foliated siltstone, intercalated with non-foliated	VN	48	20.90	Aspy		1-2	19.22	19.38			C	20.08	21.11			
				zones with weakly developed schistosity and fine- to medium-grain size. Foliation	VN	80	21.11	Aspy		1	19.38	19.63			C	21.11	22.18			
				compositional banding) is marhed by alternating bands of olive-green amphibole and	FO	50	20.24	Hem		5	19.22	19.81			C	22.18	23.26			
				and darker biotite-amphibole. Band thickness is variable, with lateral thinning and	VN	50	20.48	Hem		15	19.81	20.07			C	23.26	24.23			
				locally discontinuous. Foliation is consistently at 50° to the core axis. Variable				Mag		-2	19.81	20.07			C	24.23	25.23			
				mineralization within the unit includes pyrrhotite-arsenopyrite stringers parallel to	VN	45	25.27	Hem		5	20.27	20.37			C	25.23	26.23			
				foliation, blebby arsenopyrite, and finely disseminated pyrite. Magnetite is localized	VN	48	27.58	Aspy-Po		4-5	20.48	20.59			C	26.23	27.56			
				within a weak to stong interval. Intervals of unit have been altered by incipient				Po		2-3	21.43				C	27.56	28.56			

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Contact Angle: **CA**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Bedding: **BD** Lamination: **LAM**

Fracture Fill: **FF**

Shear Zone: **SZ**

Vein: **VN**; Veinlet: **vlt**

Alteration: Sericitization **Ser**; Silicification **Sil**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Core: **C**

Standard : **S**

Blank: **B**

FORTUNE MINERALS LIMITED				Project Name: NICO								Hole Number: 291 Hole Size: HQ				Page: 2 of 11			
				Date: 18-Jun-10								Location: Line 25+50W 3+58N							
				Logger: Greg Robinson								Dip: 70 Az: 200							
Primary		Secondary		LITHOLOGY Detailed Description	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type			Assay Au ppb	Check Au g/t	Cobalt %	
FROM	TO	From	To		Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From				To
				hematization of variable intensity .				Mag		2	21.92	22.63		C	28.56	30.00			
		19.63	20.05	Locally intense hematite alteration.	VN	55	30.46	Py		trace	22.44	22.48		C	30.00	31.05			
		21.92	25.00	Magnetite-altered metasilstone.				Mag+Hem		5-10	22.76	22.84							
		25.18	30.20	Patchy incipient to locally intense hematite alteration.				Po		1-2	23.06								
		24.37	24.52	Silicification within local irregular fracture network.				Aspy		1-2	30.68								
		30.19	30.69	Magnetite-altered metasilstone.				Aspy		5	30.85	30.88							
		29.80	30.33	Irregular en-echelon carbonate vein network.															
				Downhole contact with porphyry gradational through 12cm.															
31.18	39.36			FELDSPAR-AMPHIBOLE PORPHYRY															
				Aphanitic grey-black matrix with 12-15% rounded to euhedral plagioclase										C	31.05	32.05			
				phenocrysts from 1-6mm, and 8-10% amphibole as <1 to 3mm clots and streaks.															
				Matrix is non-magnetic with incipient hematite alteration consistent throughout unit.	JO	42	31.89												
				Unit is locally crosscut by irregular en-echelon quartz veins and carbonate vein.															
				Trace finely disseminated arsenopyrite locally within unit. Downhole contact is															
				gradational through brecciated boundary with metasilstone over 95cm.										C	37.93	39.36			
				Chloritic along joints crosscutting unit.															
		38.41	39.36	Brecheiated downhole contact with schist.															
								Py		2	40.88			C	39.36	40.37			
39.36	71.93			MODERATELY MINERALIZED BIOTITE-AMPHIBOLE SHIST with LOCAL MAGNETITE	FO	45	43.76	Mag		trace	41.98	42.59		C	40.37	41.43			
				Fine-grained olive-green to black foliated siltstone. Foliation is marked by olive-green				Po+Aspy		2-4	44.67	46.17		C	41.43	42.45			
				amphibole and black biotite-amphibole compositional banding. Unit is intercalated				Po±Aspy±Py		1	46.17	49.34		C	42.45	43.39			
				with zones of fine- to medium-grained biotite-amphibole with poorly developed				Mag		trace	49.50								
				foliation. Unit exhibits moderate mineralization with increased sulfide content				Po+Aspy±Py		2	49.86	51.77		C	43.39	44.40			
				downhole. Blebby pyrrhotite and blebby pyrrhotite-arsenopyrite with local				Aspy+Py		1	52.22			C	44.40	45.52			
				pyrrhotite-arsenopyrite stringers that crosscut foliation. Patches of blebby pyrite are				Aspy±Po±Py		1-2	53.22	54.17		C	45.52	46.52			
				localized within poorly foliated interval. Magnetite is localized within discrete	FO	50	56.31	Hem		2-3	53.42	53.52		C	46.52	47.51			
				horizons. Intervals with well developed foliation consistently at 50 ° to core axis.				Po±Py		1	55.00	56.13		C	47.51	48.47			
				Band thickness is variable, with lateral thinning and locally discontinuous. Unit is				Aspy		1	56.26			C	48.47	49.51			
				crosscut by chlorite-calcite fractures parallel to foliation. Silicification and jasper veins and pods				Mag		trace	56.41			C	49.51	50.51			
				form irregular network near uphole contact. Locally, magnetite exists as discrete bands.	FO	50	64.00	Mag		trace	57.00	57.04							
		39.36	40.88	Silicified/hematized metasilstone.				Aspy		1-2	57.31	57.51		C	50.51	51.56			
		44.07	48.65	Poorly foliated biotite-amphibole metasilstone.				Aspy±Po		2-3	59.92	60.78		C	51.56	52.56			
		50.20	51.78	Poorly foliated biotite-amphibole metasilstone.				Mag		1.2	60.82	61.19		C	52.56	53.56			
		53.87	55.69	Poorly foliated biotite-amphibole metasilstone.				Aspy		2-4	61.19	62.89		C	53.56	54.64			
		58.15	59.63	Biotite-amphibole+magnetite metasilstone.				Msg		1-2	64.16			C	54.64	55.64			

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Alteration: Sericitization **Ser**; Silicification **Sil**

Core: **C**

Contact Angle: **CA**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Standard : **S**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Fracture Fill: **FF**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Blank: **B**

Bedding: **BD** Lamination: **LAM**

Shear Zone: **SZ**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Vein: **VN**; Veinlet: **vlt**

FORTUNE MINERALS LIMITED				Project Name: <u> NICO </u>								Hole Number: <u> 291 </u> Hole Size: <u> HQ </u>				Page: <u> 3 </u> of <u> 11 </u>						
				Date: <u> 18-Jun-10 </u>								Location: <u> Line 25+50W </u> <u> 3+58N </u>										
				Logger: <u> Greg Robinson </u>								Dip: <u> 70 </u> Az: <u> 200 </u>										
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type			Assay	Check	Cobalt				
FROM	TO	From	To		Detailed Description			Type	Angle	Metres	Type	Angle	%	From	To				Sample #	C/S/B	From	To
		62.39	63.35	Biotite-amphibole+magnetite metasiltstone.				Mag			trace	64.70	65.15									
		71.38	71.68	Unmineralized subarkosic wacke. Uphole and downhole contact with metasiltstone				Aspy			1	64.20	64.22									
				gradational over 9cm and 5cm respectively. Subunit is greyish white with a green				Aspy			2-3	65.15	66.14		C	55.64	56.63					
				hue, medium-grained, amphibole (50%), quartz (25%) biotite (15%) with minor				Aspy			2	66.66	66.80		C	56.63	57.62					
				chlorite.				Mag			TRACE	66.13	67.00		C	57.62	58.62					
				Weak foliation of ground mass resulting from grain orientation of biotite.				Aspy			1-2	67.33	67.43		C	58.62	59.62					
				Subunit is very poorly mineralized, with trace fine disseminations of arsenopyrite.				Aspy			1	68.09	68.21		C	59.62	60.66					
				Downhole contact with biotite-amphibole+magnetite metasiltstone diffuse.				Mag			trace	68.09	68.62									
								Aspy+Po			1-2	68.71	68.76		C	60.66	61.66					
								Mag			trace	68.94	69.77		C	61.66	62.67					
								Aspy			1-2	68.94	68.96		C	62.67	63.66					
								Aspy			1	68.34	68.70		C	63.66	64.66					
								Aspy			1	70.29	70.38		C	64.66	65.66					
								Mag			4-5	70.40	71.01									
								Aspy±Py			2	70.60	71.29		C	65.66	66.67					
								Aspy			1	71.76	71.80		C	66.67	67.67					
															C	67.67	68.67					
															C	68.67	69.67					
															C	69.67	70.67					
71.93	83.32			STRONGLY MINERALIZED BIOTITE-AMPHIBOLE+MAGNETITE SCHIST	CA	50	71.93	Aspy±Po			1-2	71.93	73.00		C	70.67	71.67					
				Fine-grained, olive green to black foliated siltstone. Foliation is marked by				Aspy			1-2	73.92	74.64		C	71.67	72.68					
				olive green amphibole and black biotite-amphibole compositional banding. Unit is	FO	49	73.29	Hem			1	74.27			C	72.68	73.68					
				intercalated with alternating intervals of banded magnetite and poorly foliated				Aspy			2-3	74.70	76.00		C	73.68	74.74					
				non-magnetic intervals. Unit exhibits strong mineralization, including variable	FO	50	74.57	Aspy			1	76.00	76.44		C	74.74	75.75					
				blebby to disseminated arsenopyrite with local arsenopyrite stringers, and local				Aspy			3-5	76.44	77.40									
				arsenopyrite±pyrrhotite and arsenopyrite± pyrite. Magnetite banding is parallel to	FO	49	80.26	Aspy			1	77.40	77.66		C	75.75	76.75					
				subparallel to foliation. Sharp downhole contact. Foliation is consistently 49-50° to	CA	50	82.50	Aspy			2	77.66	78.20		C	76.75	77.74					
				core axis through unit.				Aspy			<1	78.20	78.65		C	77.74	78.75					
		72.15	72.69	Non-magnetic poorly foliated biotite-amphibole metasiltstone.				Aspy			2	78.65	79.44		C	78.75	79.75					
		73.72	75.21	Non-magnetic poorly foliated biotite-amphibole metasiltstone.				Aspy			2-3	79.60	80.66		C	79.75	80.75					
		77.33	77.66	Non-magnetic poorly foliated biotite-amphibole metasiltstone.				Aspy			1	80.66	82.50									
		78.02	78.60	Non-magnetic poorly foliated biotite-amphibole metasiltstone.											C	80.75	81.75					
				Locally crosscut by fine parallel en-echelon quartz veins, and hematite-calcite veins.											C	81.75	82.75					
															C	82.75	83.75					

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**
Fracture Fill: **FF**
Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**
Bedding: **BD** Lamination: **LAM**
Vein: **VN**; Veinlet: **vlt**

Alteration: Sericitization **Ser**; Silicification **Sil**
Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**
Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**
Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Core: **C**
Standard : **S**
Blank: **B**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 4 of 11			
				Date: 18-Jun-10				Location: Line 25+50W 3+58N											
				Logger: Greg Robinson				Dip: 70				Az: 200							
Primary		Secondary		LITHO LOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay		Check	Cobalt	
FROM	TO	From	To	Detailed Description	Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From	To	Au ppb	Au g/t	%
		82.50	82.89	Nonfoliated biotite-amphibole schist. Fine-grained olive green nonfoliated to locally poorly foliated metasiltstone. Unit composition predominantly olive green amphibole with minor biotite in poorly foliated interval.				Aspy		trace	82.65	82.89							
				Unit is locally crosscut by discordant hematite+calcite vein trace mineralization localized to poorly foliated interval as small blebs and fine arsenopyrite disseminations.															
				Sharp downhole contact.	CA	54	87.89												
		82.89	83.32	Unmineralized chloritic biotite-amphibole schist (intermediate dyke/ or subarkosic wacke). Sharp uphole contact, downhole contact with metasiltstone gradational over 6cm. Unit is greyish white with green hue, medium-grained amphibole (40-50%), quartz (25-30%) and biotite (~8-10%), with minor chlorite.										C	83.75	84.75			
				Very weak foliation of matrix resulting from biotite grain orientation. Unit is non-mineralized. Unit has been locally crosscut by quartz ±hematite vein.										C	84.75	85.75			
														C	85.75	86.75			
														C	86.75	87.90			
														C	87.90	88.91			
83.32	91.12			WEAKLY MINERALIZED BIOTITE-AMPHIBOLE+/-MAGNETITE				Aspy		1	82.89	83.62							
				Fine-grained olive green to black foliated metasiltstone intercalated with nonfoliated to poorly foliated intervals. Foliation marked by olive green amphibole and black biotite-amphibole compositional banding with local intervals with variable magnetite banding and discordant magnetite. Band thickness is variable <1mm to 1cm with lateral thinning and locally discontinuous. Unit has been locally altered by quartz-hematite. Moderate mineralization within the more foliated intervals as blebby and disseminate arsenopyrite. Mineralization within the poorly foliated intervals is weak with trace arsenopyrite disseminations and blebs. Unit exhibits poor competency over 50cm interval (87.50 to 88.00m), atypical of unit. Downhole contact is gradational over 4cm.	FO	50	85.85	Aspy		2	83.62	84.89							
					FO	54	86.50	Aspy		1-2	86.13	87.07							
								Aspy		1	87.30	88.00							
								Mag		trace	87.13	88.00							
								Aspy		trace	88.71	88.81							
					FZ			FZ			87.36	88.00							
		83.62	85.17	Biotite-amphibole+magnetite.															
		86.38	86.55	Biotite-amphibole+magnetite.															
		86.90	87.07	Biotite-amphibole+magnetite.															
		88.00	88.81	Biotite-amphibole+magnetite.															
		88.81	89.87	Weakly mineralized massive subarkosic wacke intercalated laminated biotite-amphibole+magnetite schist and biotite-amphibole schist.				Aspy		1	88.97	89.32							
								Aspy		trace	89.47	89.53		C	88.91	89.91			
				Unit is greyish-white with green hue, medium-grained, quartz (40-50%), amphibole (30%) and biotite (~15%), and minor chlorite. Very weak foliation resulting from biotite orientation. Discordant amphibole alteration crosscuts unit locally.	FO	51	89.03	Hem		1	89.59	89.62		C	89.91	90.87			
														C	90.87	91.87			
														C	91.87	92.87			
				Unit is locally mineralized with blebby arsenopyrite within or adjacent to zones of amphibole alteration.										C	92.87	93.87			

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**
Fracture Fill: **FF**
Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**
Bedding: **BD** Lamination: **LAM**

Alteration: Sericitization **Ser**; Silicification **Sil**
Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**
Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**
Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Core: **C**
Standard : **S**
Blank: **B**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291 Hole Size: HQ				Page: 5 of 11						
				Date: 18-Jun-10				Location: Line 25+50W 3+58N										
				Logger: Greg Robinson				Dip: 70 Az: 200										
Primary		Secondary		LITHOLOGY Detailed Description	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay Au ppb	Check Au g/t	Cobalt %	
FROM	TO	From	To		Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B				From
				Subunit of fine-grained biotite-amphibole is non-foliated olive-green, with local hematization and trace finely disseminated arsenopyrite.														
				Downhole contact is gradational over 7.8cm.	CA	52	89.87											
				Subunit of fine-grained, laminated biotite-amphibole-magnetite metasiltstone interval with diffusive uphole and downhole contacts is weakly mineralized with finely disseminated to blebby arsenopyrite.														
		88.97	89.10	Laminated biotite-amphibole+magnetite.														
		89.47	89.67	Biotite-amphibole.														
		89.87	91.12	Strongly mineralized biotite-amphibole+magnetite metasiltstone. Fine-grained olive-green with local black laminations.				Aspy		trace	89.87	90.05						
				Foliation is marked by subparallel bands of biotite-amphibole and magnetite.				Aspy		1-2	90.05	90.26						
				Locally, magnetite forms discontinues bands, Crosscut by the amphibole-magnetite. Majority of unit is nonfoliated amphibole with minor biotite.				Aspy		3-5	90.26	91.06						
				Nonfoliated intervals are strongly mineralized with blebby arsenopyrite, with local finely disseminated arsenopyrite and local hematite alteration. Downhole contact is gradational over 6cm.				Hem		trace	90.71							
91.12	94.00			STRONGLY FOLIATED WEAKLY MINERALIZED BIOTITE-AMPHIBOLE SCHIST	FO	52	92.52	Apsy		trace	91.12	91.63		C	93.87	94.87		
				Fine-grained olive green to black, strongly foliated metasiltstone. Foliation marked by alternating amphibole and biotite-amphibole compositional banding. Bands thin laterally, are locally discordant with amphibole crosscutting the biotite-amphibole.				Apsy		1	91.63	91.72		C	94.87	95.87		
				Locally, unit is crosscut by discordant quartz+arsenopyrite vein. Weak mineralization within unit exhibited by trace finely disseminated arsenopyrite and localized arsenopyrite blebs. Downhole contact is gradational with weak magnetite content, and increasingly diffuse foliation.				Apsy		trace	91.72	92.37		C	95.87	96.87		
				Foliated biotite-amphibole-magnetite.				Apsy		1	92.37	92.47		C	96.87	97.87		
								Apsy		trace	92.47	93.51		C	97.87	98.88		
								Apsy		1-2	93.51	94.04						
		93.51	94.00											C	98.88	99.89		
														C	99.89	100.89		
														C	100.89	102.02		
94.00	95.29			WEAKLY MINERALIZED SUBARKOSIC WACKE INTERCALATED with BIOTITE-AMPHIBOLE SCHIST				Aspy		trace	94.04	94.76						
				Unit is medium-grained, grey-white with greenish hue composed of medium-grained quartz (~50%) with fine-grained hornblende (30%) and medium-grained biotite (~15%) with minor chlorite. Unit is crosscut by discordant quartz and quartz-amphibole and quartz -hematite.				Aspy		1-2	95.07	95.14						
				Unit is weakly mineralized with fine disseminations and rare blebs of arsenopyrite. Locally, unit is intercalated by biotite-amphibole schist.				Hem		1	95.14	95.29						

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Fracture Fill: **FF**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Bedding: **BD** Lamination: **LAM**

Alteration: Sericitization **Ser**; Silicification **Sil**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Core: **C**

Standard : **S**

Blank: **B**

FORTUNE MINERALS LIMITED				Project Name: <u>NICO</u>				Hole Number: <u>291</u> Hole Size: <u>HQ</u>				Page: <u>6</u> of <u>11</u>							
				Date: <u>18-Jun-10</u>				Location: <u>Line 25+50W</u> <u>3+58N</u>											
				Logger: <u>Greg Robinson</u>				Dip: <u>70</u> Az: <u>200</u>											
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay		Check	Cobalt	
FROM	TO	From	To	Detailed Description	Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From	To	Au ppb	Au g/t	%
				Downhole contact is gradational over 10cm. Unit has been pervasively altered															
		94.74	94.85	by biotite-amphibole.															
				Biotite-amphibole schist.	CA	65	95.29												
					CA	64	95.29	Aspy		1	95.29	96.30		C	103.00	104.00			
95.29	101.83			BIOTITE-AMPHIBOLE+/-MAGNETITE SCHIST				Hem		trace	96.30	96.34		C	104.00	105.00			
				Strongly foliated biotite-amphibole+magnetite schist. Unit is fine-grained with				Aspy		~1	96.34	96.74		C	105.00	106.00			
				alternating bands of olive green and dark green to black compositional bands.				Aspy		1-2	96.74	97.20		C	106.00	107.02			
				Banding is on a mm up to cm scale, with individual bands thinning laterally and				Hem		trace	97.06			C	107.02	108.11			
				locally discordant. Magnetite banding is parallel to foliation, and locally discordant.				Aspy		3-5	97.20	97.29							
				Unit is strongly mineralized with consistent blebby to disseminated arsenopyrite,				Aspy		2-3	97.36	97.77							
				with locally very strong intervals of blebby arsenopyrite.				Aspy		1-2	97.77	99.10		C	108.11	109.12			
				Schist is locally weakly hematite altered.				Aspy		2-3	99.10			C	109.12	110.12			
								Aspy		3-5	99.21	99.41		C	110.12	111.12			
								Aspy		2	99.60	99.86							
								Aspy		1-2	99.86	100.36							
		96.31	96.99	Non-Magnetic biotite-amphibole schist.				Aspy		3-4	100.36	100.49							
								Aspy		2-3	100.47	100.66							
101.83	111.24			BIOTITE-AMPHIBOLE SCHIST INTERCALATED with BIOTITE-AMPHIBOLE-				Aspy		1	100.66	100.79							
				ALTERED SUBARCOSIC WACKE				Aspy±Py		2-3	100.99	101.04							
				Fine-grained olive green with local intervals of foliation. Foliation is marked by				Aspy		trace	101.04	101.19							
				alternating bands of olive green amphibole and dark green black biotite-amphibole				Aspy±Py		3-5	101.19	101.24							
				compositional banding. Banding is irregular and predominantly discordant.				Aspy±Po		1-2	101.24	101.40							
				Unit is locally incipiently hematite-altered, and crosscut by rare quartz and				Po±Aspy		2	101.40	101.45							
				hematite-quartz discordant veins. Unit is locally magnetite-altered.				Aspy		trace	101.45	101.61							
				Schist is intercalated with intervals of biotit-amphibole-altered subarkosic wacke.				Py±Aspy±Hem		2-3	101.61	101.71							
				Unit is variably mineralized with disseminated to blebby arsenopyrite.				Aspy±Py		3-5	101.71	101.83							
								Aspy±Py		1-2	101.93	102.87							
								Aspy±Hem		1	103.58	104.73							
								Aspy		trace	104.73	107.63							
								Hem		trace	107.55	108.18							
								Mag		trace	107.88	108.84							
								Aspy±Py±Mag		1-2	109.27	109.46							
								Hem±Aspy		trace	109.66	110.17							
								Aspy		<1	111.00	111.24							

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Alteration: Sericitization **Ser**; Silicification **Sil**

Core: **C**

Contact Angle: **CA**

Intensity: Weak**Wk**; Moderate **Mod**; Strong **Str**

Standard : **S**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Blank: **B**

Bedding: **BD** Lamination: **LAM**

Vein: **VN**; Veinlet: **vlt**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 7 of 11				
				Date: 18-Jun-10				Location: Line 25+50W 3+58N												
				Logger: Greg Robinson				Dip: 70				Az: 200								
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay		Check		Cobalt	
FROM	TO	From	To	Detailed Description	Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From	To	Au ppb	Au g/t		%
		102.76	102.95	Biotite-amphibole-altered subarkosic wacke.				Aspy		1	111.34	112.21		C	111.12	112.12				
		103.01	103.31	Biotite-amphibole-altered subarkosic wacke.				Aspy		1-2	112.21	112.35		C	112.12	113.12				
		104.21	104.47	Biotite-amphibole-altered subarkosic wacke.				Aspy		trace	112.83	113.21		C	113.12	114.12				
		104.88	105.10	Biotite-amphibole-altered subarkosic wacke.				Aspy		trace	113.54	113.62		C	114.12	115.12				
		106.53	107.40	Weakly magnetic biotite-amphibole+/-magnetite schist.				Aspy		trace	113.97	114.26		C	115.12	116.12				
								Hem		1	114.37	114.48		C	116.12	117.12				
				Arsenopyrite+/-pyrite, arsenopyrite+/-pyrrhotite.				Aspy±Py±Hem		2-3	114.68	115.00								
				Downhole contact is sharp.				Aspy		3-5	115.20	115.34		C	117.12	118.12				
								Aspy		1	115.34	115.51		C	118.12	119.12				
111.24	124.10			BIOTITE-AMPHIBOLE-MAGNETITE SCHIST INTERCALATED with BIOTITE-AMPHIBOLE SCHIST				Aspy		1-2	115.51	118.66		C	119.12	120.12				
								Aspy		3-5	118.16	118.54		C	120.12	121.12				
				Strongly foliated biotite-amphibole-magnetite schist is fine-grained. Foliation is marked by alternating bands of olive green amphibole, dark green biotite-amphibole and black-grey magnetite. Bands are subparallel, thin laterally, and are locally discordant. Locally unit has been weakly hematized. Unit is moderately mineralized with disseminated, blebby and stringers of arsenipyrite+/-pyrite. Unit is intercalated with non-magnetic, poorly foliated biotite-amphibole schist. Downhole contact is :				Aspy±Py		1	118.54	119.57		C	121.12	122.12				
								Aspy		1-3	119.57	120.25								
								Aspy		1-2	120.25	121.00								
								FZ			119.26	119.46								
		114.02	115.00	Biotite-amphibole schist.				Aspy		trace	121.23	121.33								
		115.50	115.92	Biotite-amphibole schist.				Aspy		1	122.30	122.35								
		119.46	119.84	Biotite-amphibole schist.				Aspy		2-4	123.22	123.33								
		120.93	121.23	Biotite-amphibole schist.				Aspy		<1	123.33	123.43								
		121.81	121.95	Biotite-amphibole schist.				Py		trace	123.52	123.54								
								Aspy		1	123.59	123.61								
124.10	146.64			BIOTITE-AMPHIBOLE-ALTERED SUBARCOSIC WACK INTERCALATED with BIOTITE-AMPHIBOLE+/-MAGNETITE				Aspy		1	124.23	124.38		C	122.12	123.12				
								Aspy		trace	124.38	124.52		C	123.12	124.12				
				Medium-grained greyish-white with green hue, with medium-grained quartz (50%), fine-grained olive green amphibole (35-40%) with fine-grained biotite.	CA	65	125.64	Chl		90	126.50	126.57		C	124.12	125.12				
				Unit is massive and generally non-magnetic with rare discordant magnetic crosscutting unit and local discordant quartz veins at low angle to core axis.				Aspy		1	128.04	128.28		C	126.12	127.10				
								Aspy		<1	128.48	128.57								
				Unit is weakly mineralized with fine disseminated to locally blebby arsenopyrite.	FO	50	133.47	Aspy		1	131.46	131.70		C	127.10	128.10				
				Wacke has been pervasively biotite-amphibole-altered. Unit is intercalated with intervals of biotite-amphibole-magnetite and biotite-amphibole schist.				Aspy		trace	132.00			C	128.10	129.10				
								Po		trace	132.56			C	129.10	130.12				
				Contact between biotite-amphibole+/-magnetite intervals is variable. Sharp to gradational over several cm's. Mineralization within subarkosic wacke is weak, with trace finely disseminated arsenopyrite locally. Downhole contact is sharp.				Po		1-2	132.73	132.82		C	130.12	131.12				
								Py±Aspy		1	134.05	134.15		C	131.12	132.12				
								Aspy		trace	135.36									

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Alteration: Sericitization **Ser**; Silicification **Sil**

Core: **C**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Standard : **S**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Blank: **B**

Bedding: **BD** Lamination: **LAM**

Vein: **VN**; Veinlet: **vlt**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 8 of 11			
				Date: 18-Jun-10				Location: Line 25+50W 3+58N											
				Logger: Greg Robinson				Dip: 70				Az: 200							
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type			Assay	Check	Cobalt	
FROM	TO	From	To		Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From				To
		125.64	127.22	Unmineralized biotite-amphibole-magnetite schist.				Po		trace	135.72			C	132.12	133.12			
				Unit is locally crosscut by 7cm interval of fine-grained dark green chlorite.				FF	50		136.08	136.16		C	133.12	134.18			
		127.40	127.80	Unmineralized biotite-amphibole schist.				Po±Aspy		1	137.82	137.94		C	134.18	135.18			
		128.70	128.90	Foliated biotite-amphibole schist.				Qtz VN	30		133.51			C	135.18	136.17			
		129.71	130.34	Biotite-amphibole-magnetite schist.				CAL VN	55		134.84			C	136.17	137.17			
		132.39	132.85	Biotite-amphibole schist.															
		133.32	134.84	Weakly mineralized Biotite-amphibole+/-magnetite.										C	137.17	138.21			
				Subunit is crosscut by discordant quartz vein, and calcite vein subparallel with										C	138.21	139.21			
				foliation. Subunit is crosscut by paired annealed fractures with intersecting minor										C	139.21	140.21			
				fractures of the same sense. Annealed fractures are parallel to foliation.										C	140.21	141.21			
		135.74	136.96	Discordantly foliated subarkoric wacke.										C	141.21	142.20			
		136.96	138.09	Biotite-amphibole schist.															
		138.09	139.92	Discordantly foliated magnetite-altered subarkosic wacke.															
		142.67	146.64	Biotite-amphibole-altered subarkosic wacke.										C	142.20	143.21			
				Matrix of sabarkosic wacke is medium-grained, greyish-white color with green hue,										C	143.21	144.21			
				composed of medium-grained quartz (~50%), fine-grained hornblende (20-30%),										C	144.21	145.28			
				olive green amphibole (locally 10-20%) and biotite (~10%). Unit is very weakly										C	145.28	146.31			
				mineralized with finely disseminated pyrite and pyrite+/-arsenopyrite. The										C	146.31	147.31			
				subarkosic wacke is intercalated with short intervals of foliated biotite-amphibole															
				schist. Uphole contact is gradational with overlying biotite-amphibole+/-magnetite															
				schist over 29cm. Downhole contact is gradationally chlorite-altered over 29cm.															
146.64	156.11	143.41	143.65	Biotite-amphibole schist.															
				MODERATELY TO STRONGLY MINERALIZED BIOTITE-AMPHIBOLE+/-				Aspy		trace	139.69	139.80		C	147.31	148.25			
				MAGNETITE SCHIST				Po		1	141.24	141.28		C	148.25	149.26			
				Fine-grained, nonfoliated olive green to discordantly foliated olive green-black.				Py		trace	141.54			C	149.26	150.25			
				Foliation marked by amphibole, biotite-amphibole and magnetite compositional				Po		1	141.66	141.80		C	150.25	151.25			
				banding. Unit is crosscut locally by discordant and en-echelon quartz veins, and is				Aspy		1	141.93	142.00		C	151.25	152.25			
				locally intensely chlorite-altered. Unit is marked by intervals of strong mineralization				Aspy±Po		trace	142.25	142.40							
				including disseminated to blebby pyrrhotite, arsenopyrite, and pyrite, and blebs and				Py±Po±Aspy		1-2	142.40	142.60		C	152.25	153.20			
				stringers of arsenopyrite+/-pyrite, pyrite+/-arsenopyrite+/-pyrrhotite.				Aspy±Py		1-2	142.66	142.75		C	153.20	154.20			
				Unit is intercalated with biotite-amphibole altered chert. Uphole and downhole				Aspy		1-2	142.97	143.00		C	154.20	155.20			
				contacts with chert are gradational over 8cm and 16cm respectively.							142.65	151.00							
				Unit is marked by locally intense faulting through measured interval.				FZ			142.65	151.00							
				Sharp downhole contact marked by onset of discordant penetrative															
				magnetite alteration.				Py		trace	143.17	143.35							

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Alteration: Sericitization **Ser**; Silicification **Sil**

Core: **C**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Standard : **S**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Blank: **B**

Bedding: **BD** Lamination: **LAM**

Fracture Fill: **FF**

Shear Zone: **SZ**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Vein: **VN**; Veinlet: **vlt**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 9 of 11			
				Date: 18-Jun-10				Location: Line 25+50W 3+58N											
				Logger: Greg Robinson				Dip: 70				Az: 200							
Primary		Secondary		LITHOLOGY	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay		Check	Cobalt	
FROM	TO	From	To	Detailed Description	Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From	To	Au ppb	Au g/t	%
								Py		1	143.35	143.53							
								Aspy		<1	143.53	144.02							
								Py±Aspy		<1	144.02	145.67							
								chl		75	146.40	146.67							
								Aspy±Py		2-4	146.67	147.59							
								Aspy		trace	148.34	148.56							
								Aspy±Py		1-2	148.56	148.90							
								Aspy		1	150.20	150.34							
								Aspy		1	150.56	150.60							
								Aspy		trace	150.80	150.94							
								Py±Aspy		1	151.18	151.45							
								Py±Aspy		2-4	151.58	152.48							
								Aspy±Py		4-5	152.48	152.74							
								Aspy		1-2	152.74	153.02							
								Aspy±Py		1	153.08	153.45							
								Aspy		trace	153.74	154.03							
156.11	175.90			STRONGLY MINERALIZED FOLIATED BIOTITE-AMPHIBOLE-MAGNETITE				FZ			166.50	175.90		C	155.20	156.20			
				SCHIST				Aspy		trace	154.25	154.44		C	156.20	157.21			
				Fine-grained olive green to dark green-black, strongly foliated schist. Foliation is	Fo	60	154.35	Aspy±Py		2-3	154.44	154.77		C	157.21	158.20			
				locally strongly discordant, but generally consistent through unit marked				Aspy		trace	154.77	156.26		C	158.20	159.20			
				by thin discontinuous bands of biotite-amphibole crosscut by discordant				Aspy		1-2	156.26	156.81		C	159.20	160.18			
				olive green amphibole. Black-grey magnetite banding locally approximates foliation,	Fo	60	160.12	Aspy		trace	156.91	157.43							
				with several intervals of strongly discordant magnetite.	Fo	55	163.29	Aspy±Py		1	157.43	157.63		C	160.18	161.18			
				Unit is locally altered by stratabound potassium feldspar banding up to 6mm thick.				Aspy		<1	157.63	157.86		C	161.18	162.18			
				Unit is also locally altered by penetrative earthy hematite-calcite.	Fo	65	167.41	Aspy±Py		1-2	157.86	158.00		C	162.18	163.19			
				Prominent faulting occurs through the lower portion of the unit.				Aspy		1	158.00	158.60		C	163.19	164.19			
				Strong mineralization of the unit includes disseminated to blebby arsenopyrite				Aspy		trace	158.60	158.82		C	164.19	165.19			
				with local blebby arsenopyrite+/-pyrite+/-pyrrhotite and pyrite stringers.				Aspy±Py		trace	158.82	159.24							
				Downhole contact is gradational through chlorite alteration over 10.0cm.				Aspy		trace	159.24	160.40		C	165.19	166.19			
		167.41	168.63	Potassium feldspar-altered biotite-amphibole schist.				Aspy±Py		1-2	160.40	160.84		C	166.19	167.19			
								VN Qtz	37		160.28			C	167.19	168.20			
								Aspy		1-2	160.90	161.74		C	168.20	169.20			
								Aspy		trace	161.74	162.41		C	169.20	170.21			
								Aspy		1-2	162.41	163.42							
								Aspy		trace	163.42	163.74		C	170.21	171.24			

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Alteration: Sericitization **Ser**; Silicification **Sil**

Core: **C**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Standard : **S**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Blank: **B**

Bedding: **BD** Lamination: **LAM**

Fracture Fill: **FF**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Shear Zone: **SZ**

Vein: **VN**; Veinlet: **vlt**

FORTUNE MINERALS LIMITED				Project Name: NICO				Hole Number: 291				Hole Size: HQ				Page: 10 of 11			
				Date: 18-Jun-10				Location: Line 25+50W 3+58N											
				Logger: Greg Robinson				Dip: 70				Az: 200							
Primary		Secondary		LITHOLOGY Detailed Description	Point data (fol, bed, cont.)			Interval data (struct, alt, sulf, oxid)					Type		Assay		Check	Cobalt	
FROM	TO	From	To		Type	Angle	Metres	Type	Angle	%	From	To	Sample #	C/S/B	From	To	Au ppb	Au g/t	%
								Aspy		1-2	163.74	163.91		C	171.24	172.20			
								Aspy		trace	164.41	164.50		C	172.20	173.21			
								Aspy		2-3	164.94	165.55		C	173.21	174.22			
								Aspy		1	165.55	165.68		C	174.22	175.22			
								Aspy		1	165.89	166.12							
								Aspy		5	166.12	166.30		C	175.22	176.22			
								Aspy		trace	166.30	167.38		C	176.22	177.34			
								Aspy		trace	168.70	169.11							
								Aspy		1-2	169.11	171.03							
								Aspy±Py		trace	171.26	171.63							
								Aspy		1	171.63	172.00							
								Aspy		2	172.00	172.72							
								Py±Aspy		1-2	173.72	174.24							
								Py		1	174.22	174.78							
								Aspy		trace	174.78	175.05							
175.90	179.82			SUBARKOSIC WACKE, MODERATELY MINERALIZED				Chl		30	175.80	175.90							
				Matrix is medium-grained, greyish-white with a greenish hue, with a composition of quartz (~50%), olive green amphibole (40-45%) and minor biotite. Unit is															
				strongly brecciated, and crosscut by parallel sets of conjugate fractures				Py		1	176.94	177.33		C	177.34	178.34			
				with fine-grained olive green amphibole. Locally fractures system includes stringers				Aspy±Py		1-3	177.33	177.75		C	178.34	179.34			
				of arsenopyrite+pyrite. Unit is highly brecciated and comprises the uphole				Aspy		<1	178.00	178.93		C	179.34	180.37			
				segment of a fault zone. Mineralization also includes disseminated to blebby	FZ	176.71	-193.10	Aspy±Py			178.93	179.82		C	180.37	181.37			
				arsenopyrite. Downhole contact is faulted.										C	181.37	182.45			
														C	182.45	183.45			
														C	183.45	184.45			
179.82	183.86			MODERATELY MINERALIZED BIOTITE-AMPHIBOLE SCHIST										C	184.45	185.45			
				Unit is thinly foliated with alternating bands of dark green and white to white green.	FO	83	180.10							C	185.45	186.45			
				Dark green bands composed of fine-grained amphibole and fine- to medium-grained biotite. Discordant amphibole-biotite crosscuts the lighter colored bands.										C	186.45	187.42			
				The white to white-green bands are fine-grained up to 1cm thick, parallel and suspect composition of selicite+amphibole (no reaction to HCl). Mineralization										C	187.42	188.40			
				includes stratabound blebby arsenopyrite and pyrite, and discordant arsenopyrite-				Aspy±Py		1-2	180.24	180.48		C	189.35	190.35			
				pyrite stringers. Unit is variably modeled to strongly brecciated, and locally overprints				Aspy±Py		1	180.57	181.03		C	190.35	191.34			
				potassium feldspar. Downhole contact is sharp.	CA	72	183.96	Aspy±Py		2	181.03	182.78		C	191.34	192.32			

Structure: Fault Gouge: **FG**; Fault Zone: **FZ**

Contact Angle: **CA**

Schistosity: **SC** Foliation: **FO** Mafic Flattening: **MF** Kink Band: **KB**

Bedding: **BD** Lamination: **LAM**

Fracture Fill: **FF**

Shear Zone: **SZ**

Vein: **VN**; Veinlet: **vlt**

Alteration: Sericitization **Ser**; Silicification **Sil**

Intensity: Weak **Wk**; Moderate **Mod**; Strong **Str**

Sulphide: Chalcopyrite **Cpy**; Pyrrhotite **Po**; Pyrite **Py**

Oxides: Hematite **Hem**; Magnetite **Mag**; Specularite **Spec**

Core: **C**

Standard : **S**

Blank: **B**

Hole Number: NICO-97-51.
Company: Fortune Minerals Limited.
Property: NICO Claims.
Claim: NICO 1.
Zone: Number Two.
Field Grid Location: L20W 1+83N.
Survey Location: UTM: X: 512492.526 Y: 7046584.112 Z: 301.131
Azimuth: 198 degrees.
Dip: -64.0 degrees (clinometer).
Acid Test: 67° (60° **corrected**) at 93.57 metres (307');
 68° (61° **corrected**) at 181.97m (597').
Casing: 3.35 metres (11').
Core Size: BQTK
Length of Hole: 181.97 metres (597').
Drill Contractor: Connors Drilling Ltd.
Date Started: June 22, 1997.
Date Completed: June 24, 1997.
Logged By: Miroslav Sidor.
Core Storage: Lou Lake Camp Site.

Interval	Description
0.00-3.35m	CASING AND DRILL HEAD TO BEDROCK.
3.35-7.11m	WEAKLY MINERALIZED BIOTITE-AMPHIBOLITE-ALTERED SUBARKOSIC WACKE. The rock is massive, fine- to medium-grained, nonfoliated and greenish-gray. It is composed of amphibole-biotite and quartz clots (25%). Locally cut by quartz veins. The rock displays hematite staining of brownish-red colour along fractures. At 4.39m, potassium metasomatism has occurred as reddish spots and patches, that increases towards the end of the interval. Medium- to fine-grained arsenopyrite is scattered throughout the rock forming local irregular stringers. The patches and bands of biotite-amphibole alternates with the potassium feldspar. The latter gradually becomes more abundant towards the end of the interval forming a gradational contact with the rhyolite. The rock is non-magnetic. <u>Arsenopyrite</u> comprises 1%. Foliation is 45° to the core axis.
7.11-35.23m	POTASSIUM FELDSPAR-ALTERED AMPHIBOLE-BIOTITE RHYOLITE. (Potassium-altered amphibole-biotite wacke) The rock is massive, fine-grained and grayish-pink. It is comprised of short irregular bands and specules of amphibole and biotite (15%) within the potassium feldspar matrix. The rock displays traces of sulphide mineralization. Scattered within are disseminated fine-grained arsenopyrite associated with amphibole-biotite aggregates. In some places arsenopyrite is medium-grained and forms clusters, with fine-grained inclusions of chalcopyrite.
7.11-13.56m	Weakly mineralized rhyolite. <u>Arsenopyrite</u> comprises 1% and <u>chalcopyrite</u> comprises 0.2%.
35.23-89.38m	IRON OXIDE-RICH BLACK ROCK SCHIST. The rock is massive, fine-grained dark grayish-green rock composed of alternating magnetite-rich bands and dark gray biotite laminae.

- The rock is magnetic to moderately magnetic and cut by sparse quartz (50° to the core axis) and tiny carbonate veinlets (50-90° to the core axis). It contains arsenopyrite stringers parallel to foliation and fine-grained chalcopyrite. The contact between rhyolite and black rock schist is gradational expressed by a decrease in the potassium feldspar patches and grains. See below for details.
- 35.23-39.33m Brecciated iron oxide-rich black rock schist with feldspar disseminations. Fragments of green biotite-amphibole, quartz and feldspar are cemented by dark green amphibole-biotite matrix with patches and specules enriched in iron oxide, which is weakly to moderately magnetic. Local stringers of arsenopyrite are observed at 35.86m.
- 39.40m Foliation of the black rock schist is 70° to the core axis.
- 41.94m Foliation of the black rock schist is 72° to the core axis.
- 47.79m Foliation of the black rock schist is 35° to the core axis.
- 48.76m Foliation of the black rock schist is 60° to the core axis.
- 50.69m Foliation of the black rock schist is 67° to the core axis.
- 54.69m Foliation of the black rock schist is 52° to the core axis.
- 62.35m Foliation of the black rock schist is 65° to the core axis.
- 40.40-46.11m Well mineralized black rock schist. Arsenopyrite comprises 10% and chalcopyrite 0.6%.
- 47.85-65.21m Well mineralized black rock schist. Arsenopyrite comprises 7% and chalcopyrite 0.4%.
- 65.21-86.61m Locally mineralized black rock schist, laminated, weakly to moderately
- 65.91-66.16m Well mineralized black rock schist. Arsenopyrite comprises 10% and chalcopyrite 1%.
- 69.39-70.09m Well mineralized black rock schist. Arsenopyrite comprises 7%.
- 70.09-71.40m Weakly mineralized black rock schist with arsenopyrite comprising 2%.
- 80.52-82.95m Weakly mineralized black rock schist with sparse arsenopyrite stringers comprising 1% and minor pyrite.
- 85.53-86.85m Weakly mineralized black rock schist with arsenopyrite stringers parallel to foliation and comprising 1%.
- 65.14m Foliation plane is 76° to the core axis.
- 69.62m Foliation plane is 73° to the core axis.
- 71.70m Foliation plane is 75° to the core axis.
- 73.60m Foliation plane is 72° to the core axis.
- 78.22m Foliation plane is 57° to the core axis.
- 80.18m Foliation plane is 75° to the core axis.
- 85.75m Foliation plane is 60° to the core axis.

89.38-144.99m**QUARTZ-FELDSPAR PORPHYRY.**

- The uphole contact with iron oxide-rich black rock schist is overprinted by potassium feldspathization and expressed only by the appearance of quartz phenocrysts within the brick red groundmass. The rock is massive, medium-grained, and greenish-gray. Quartz phenocrysts comprise 15-20%. Biotite-amphibole comprises 5% and the feldspar matrix comprises 80%. Quartz phenocrysts are 3-5mm in size. Amphibole occurs as tiny specules. Potassium feldspar occurs as patches. At the beginning of the interval the rock contains fine-grained chalcopyrite and arsenopyrite. The rock is non-magnetic. Feldspar-quartz porphyry has become brick red within the zones of potassium feldspathization and includes patches of green colour enriched in amphibole, arsenopyrite, pyrite and chalcopyrite. Usually all sulphides are fine-grained and form irregular bands, clots and stringers. Details are referred to hereafter.
- 103.62-104.70m Weakly mineralized feldspar-quartz porphyry with chalcopyrite stringers comprising 1%.

Well mineralized potassium-altered feldspar-quartz porphyry of brick red colour.

- 104.70-105.61m Arsenopyrite comprises 8%, pyrite comprises 5% and chalcopyrite comprises 1%.
- 107.60-108.22m Well mineralized potassium-altered gray-red feldspar-quartz porphyry. Pyrite comprises 5%, arsenopyrite comprises 3% and chalcopyrite comprises 1%.
- 111.12-115.71m Mineralized potassium-altered feldspar-quartz porphyry. Arsenopyrite comprises 2.5%, pyrite comprises 1% and minor chalcopyrite.
- 115.71-117.20m Well mineralized potassium-altered feldspar-quartz porphyry. Arsenopyrite comprises 4% and pyrite comprises 1.5%.
- 117.20-127.20m Mineralized potassium feldspar-altered feldspar-quartz porphyry. Arsenopyrite comprises 2% and pyrite comprises 1.5%.
- 144.99m The downhole contact with iron oxide-rich black rock schist is overprinted by potassium feldsparization.

144.99-150.35m**IRON OXIDE-RICH BLACK ROCK SCHIST.**

The rock is dark grayish-green, fine-grained, with a laminar fabric at 70-85° to the core axis. It is composed of alternating amphibole-biotite and magnetite-rich quartz-amphibole bands and laminae. Quartz veins crosscut the rock at 10° to the core axis. At 150.35m, biotite laminae and magnetite-rich bands become sparse and subordinate to the prevalent amphibole-rich bands. From this interval the rock is weakly magnetic to non-magnetic.

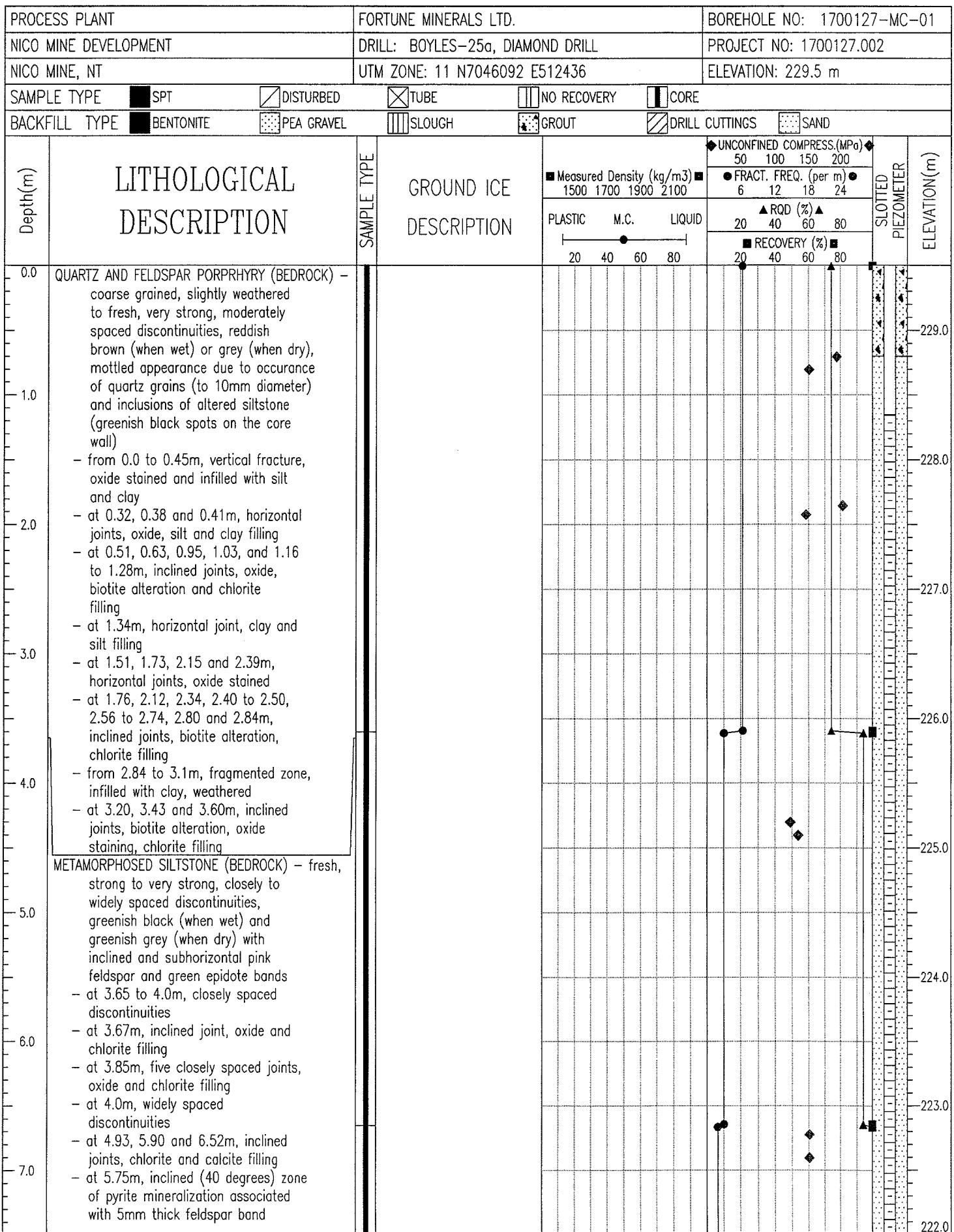
- 144.99-149.80m Well mineralized black rock schist containing arsenopyrite stringers and irregular bands concordant to the bedding plane, with fine-grained chalcopyrite. Arsenopyrite comprises 5% and chalcopyrite comprises 1%.

150.35-181.97m**BIOTITE-AMPHIBOLE-ALTERED SILTSTONE.**

A massive, fine-grained, olive gray rock with a foliation plane between 68-80° to the core axis. It displays weak to moderate magnetism and is composed of blocky biotite-amphibole with alternating bands of light olive gray and magnetite-rich dark gray laminae. Locally it includes very sparse clots of fine-grained arsenopyrite and chalcopyrite, but it is generally unmineralized.

- 145.21m The foliation is 70° to the core axis.
- 149.63m The foliation is 85° to the core axis.
- 151.52m The foliation is 80° to the core axis.
- 158.05m The foliation is 60° to the core axis.
- 163.88m The foliation is 72° to the core axis.
- 169.88m The foliation is 64° to the core axis.
- 174.52m The foliation is 68° to the core axis.
- 178.45m The foliation is 68° to the core axis.

End of Hole - 181.97 Metres



EBA ENGINEERING CONSULTANTS LTD.
Edmonton, Alberta

LOGGED BY: VER

REVIEWED BY: VER

Fig. No: 1700127-11

COMPLETION DEPTH: 10 m

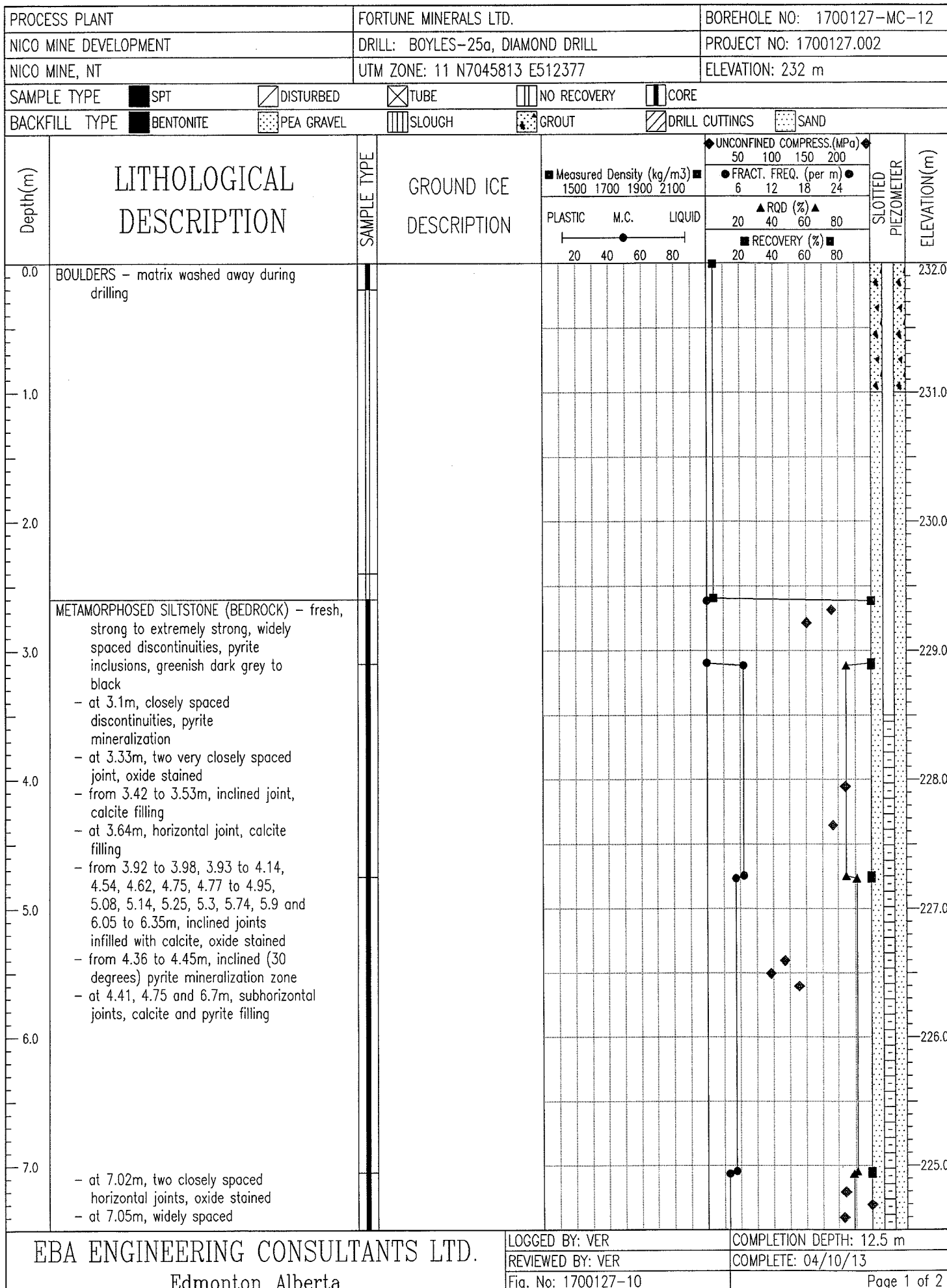
COMPLETE: 04/10/14

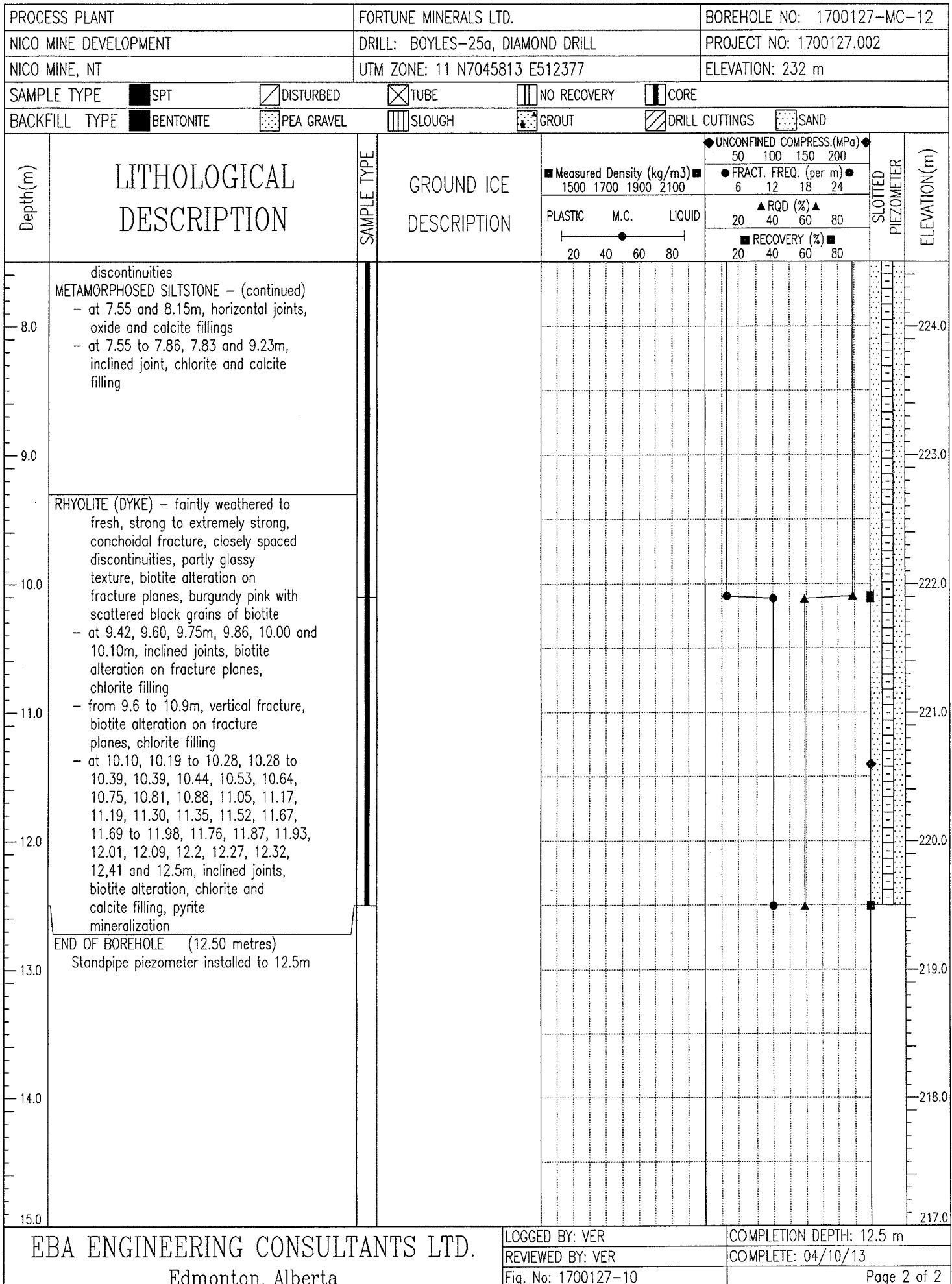
Page 1 of 2

PROCESS PLANT		FORTUNE MINERALS LTD.		BOREHOLE NO: 1700127-MC-01	
NICO MINE DEVELOPMENT		DRILL: BOYLES-25a, DIAMOND DRILL		PROJECT NO: 1700127.002	
NICO MINE, NT		UTM ZONE: 11 N7046092 E512436		ELEVATION: 229.5 m	
SAMPLE TYPE ☒ SPT ☐ DISTURBED ☒ TUBE ☐ NO RECOVERY ☐ CORE					
BACKFILL TYPE ☒ BENTONITE ☐ PEA GRAVEL ☐ SLOUGH ☐ GROUT ☐ DRILL CUTTINGS ☐ SAND					

Depth(m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION	Measured Density (kg/m ³) 1500 1700 1900 2100 PLASTIC M.C. LIQUID 20 40 60 80	UNCONFINED COMPRESS. (MPa) 50 100 150 200 ● FRACT. FREQ. (per m) ● 6 12 18 24 ▲ RQD (%) ▲ 20 40 60 80 ■ RECOVERY (%) ■ 20 40 60 80	SLOTTED PIEZOMETER	ELEVATION(m)
8.0	METAMORPHOSED SILTSTONE - (continued) - at 7.22, 7.36, 8.07, 8.32, 8.58 and 8.95m, inclined joints, chlorite and calcite filling						222.0
9.0	- from 8.76 to 9.13m, vertical fracture, oxide staining and chlorite filling						221.0
10.0	END OF BOREHOLE (10.00 metres) Standpipe piezometer installed to 10.0m						220.0
11.0							219.0
12.0							218.0
13.0							217.0
14.0							216.0
15.0							215.0

EBA ENGINEERING CONSULTANTS LTD. Edmonton, Alberta		LOGGED BY: VER	COMPLETION DEPTH: 10 m
		REVIEWED BY: VER	COMPLETE: 04/10/14
		Fig. No: 1700127-11	Page 2 of 2





PROJECT: 05-1117-032

RECORD OF BOREHOLE: GA-06-12

SHEET 1 OF 3

LOCATION: N 7047274.0 ; E 514497.0

DRILLING DATE: Apr. 24 - 25, 2006

DATUM:

ELEVATION: 221 (APPROXIMATE) COORDINATE: UTM NAD 27 ZONE 11

DRILL RIG: BOYLES 29A

DRILLING CONTRACTOR: CONNORS DRILLING

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLE		GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s					ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.		TYPE	WATER CONTENT PERCENT						
								Wp	W	Wi	10 ⁻⁶			10 ⁻⁵
0	75 mm Ø PC CORING	GROUND SURFACE		221.00										
		Dark brown, amorphous PEAT, some silt and sand (washed out by drilling), trace cobbles		0.00	1A	RC							Bentonite	
		SEE SHEET 2 FOR LOG OF CORED BEDROCK		220.46										
1		Note: Relocated 17 m east due to accessibility concerns.		0.54			CONTINUED NEXT PAGE (ON ROCK LOG)							
2														
3														
4														
5														
6														
7														
8														
9														
10		CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50



LOGGED: DL

CHECKED: PM

MIS-BHS 005 051117032.GPJ GAL-MISS.GDT 21/12/06

PROJECT: 05-1117-032

RECORD OF DRILLHOLE: GA-06-12

SHEET 2 OF 3

LOCATION: N 7047274.0 ; E 514497.0

DRILLING DATE: Apr. 24 - 25, 2006

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: BOYLES 29A

DRILLING CONTRACTOR: CONNORS DRILLING

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH % RETURN	RECOVERY		R.Q.D. % PER 0.3 m	FRACT INDEX PER 0.3 m	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec				UNC Index (MPa)	STRAIN %	NOTES WATER LEVELS INSTRUMENTATION	
								TOTAL CORE %	SOLID CORE %			TYPE AND SURFACE DESCRIPTION	10 ⁰	10 ¹	10 ²	10 ³					
								JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate	BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage			PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular	PO - Polished K - Slickensided SM - Smooth Ro - Rough MB - Mechanical Break	BR - Broken Rock							
		CONTINUED FROM PREVIOUS PAGE		220.46 0.54																	
1		RHYOLITE (BEDROCK) Dark grey and red, fresh, strong to very strong close to moderately fractured igneous rock			1B							JN, PL, Ro none JN, PL, VR none JN, PL, VR none JN, PL, VR 1mm brown silt								Bentonite Backfill	
2					2							JN, UN, VR red hard JN, PL, Ro none JN, PL, Ro none JN, PL, VR none JN, UN, VR none JN, PL, Ro none JN, CU, Ro none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro red hard JN, UN, Ro none JN, PL, Ro none JN, PL, VR none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none SHR, UN, VR none									
3					3							JN, PL, Ro grey hard JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none									
4					4							JN, PL, VR none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none JN, PL, Ro none JN, IR, VR none JN, IR, VR none JN, PL, VR none JN, PL, VR none									
5					5							JN, PL, Ro 2 pieces of 1" dia. gravels (round-subround) infill may be washed out JN, PL, VR none JN, UN, VR none JN, UN, VR none JN, PL, Ro none JN, UN, VR none JN, UN, VR none JN, PL, Ro none									
6																					
7																					
8																					
9																					
10																					
		CONTINUED NEXT PAGE																			

DEPTH SCALE

1 : 50



LOGGED: DL

CHECKED: PM

MIS-RCK 008 051117032.GPJ GAL-MISS.GDT 21/12/06

PROJECT: 05-1117-032

RECORD OF DRILLHOLE: GA-06-12

SHEET 3 OF 3

LOCATION: N 7047274.0 ; E 514497.0

DRILLING DATE: Apr. 24 - 25, 2006

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: BOYLES 29A

DRILLING CONTRACTOR: CONNORS DRILLING

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR RETURN	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate	BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage	PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular	PO - Polished K - Slickensided SM - Smooth Ro - Rough MB - Mechanical Break	BR - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.	RECOVERY TOTAL CORE % SOLID CORE % R.Q.D. %	FRACT INDEX PER 0.3 m CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec 10 ⁻⁸ 10 ⁻⁷ 10 ⁻⁶ 10 ⁻⁵	UNC Index (MPa) 1 2 3 4 5 6 7 8 9 10	STRAIN %	NOTES WATER LEVELS INSTRUMENTATION
11	50 mm Ø ND-2 CORING	--- CONTINUED FROM PREVIOUS PAGE --- RHYOLITE (BEDROCK) Dark grey and red, fresh, strong to very strong close to moderately fractured igneous rock																		
12																				
13																				
14																				
15																				
16																				
17		END OF BOREHOLE		206.00 15.00																
18																				
19																				
20																				

DEPTH SCALE

1 : 50



LOGGED: DL

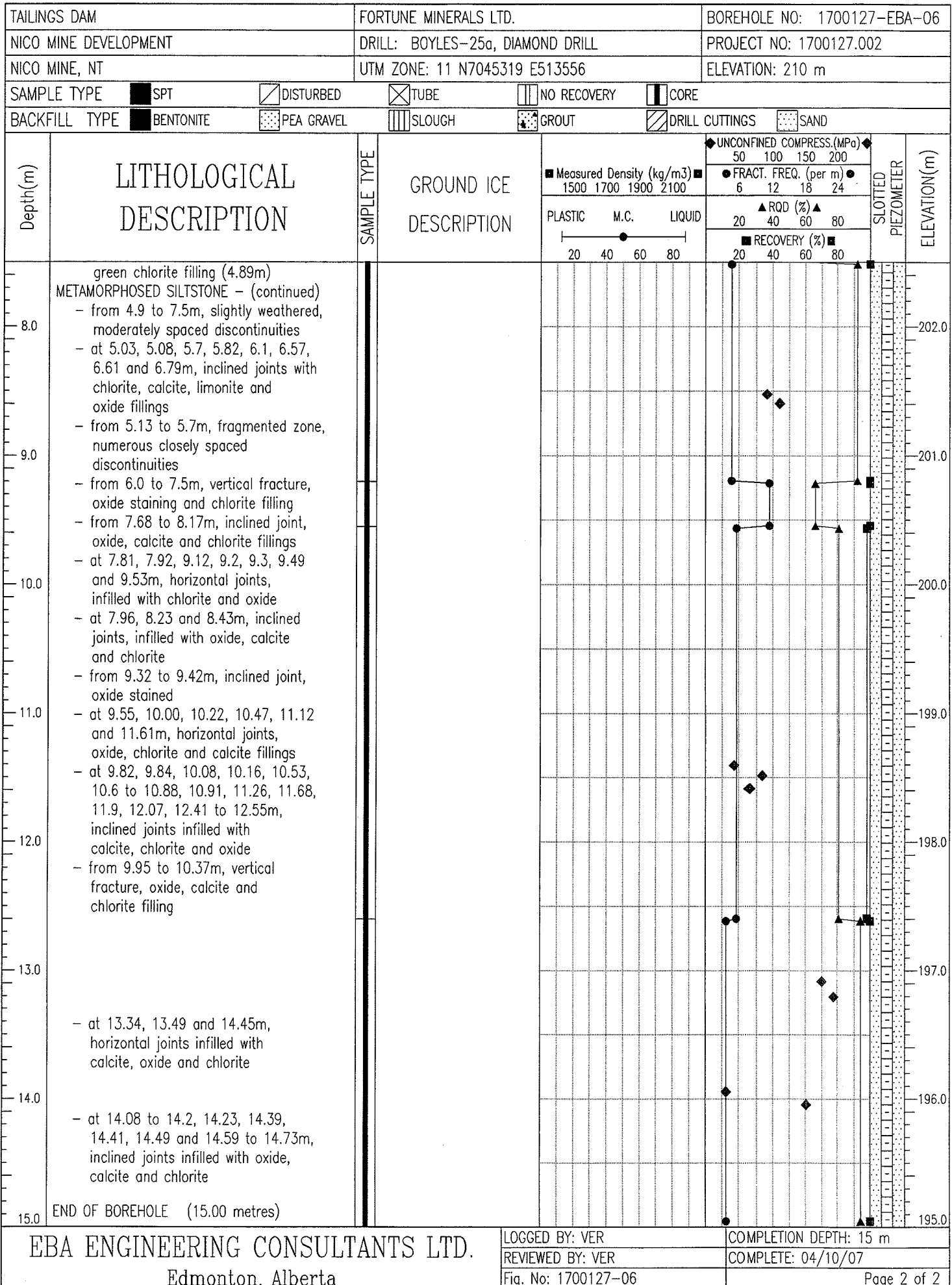
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MIS-RCK 008 051117032.GPJ GAL-MISS.GDT 21/12/06

TAILINGS DAM		FORTUNE MINERALS LTD.		BOREHOLE NO: 1700127-EBA-06	
NICO MINE DEVELOPMENT		DRILL: BOYLES-25a, DIAMOND DRILL		PROJECT NO: 1700127.002	
NICO MINE, NT		UTM ZONE: 11 N7045319 E513556		ELEVATION: 210 m	
SAMPLE TYPE ☒ SPT ☐ DISTURBED ☒ TUBE ☐ NO RECOVERY ☐ CORE					
BACKFILL TYPE ☒ BENTONITE ☐ PEA GRAVEL ☐ SLOUGH ☐ GROUT ☒ DRILL CUTTINGS ☐ SAND					

Depth(m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	GROUND ICE DESCRIPTION	Measured Density (kg/m ³)			UNCONFINED COMPRESS. (MPa)		SLOTTED PIEZOMETER	ELEVATION(m)
				1500	1700	1900	2100	50		
0.0	MOSS AND LICHEN - roots, (50mm thick) BOULDERS, COBBLES AND GRAVEL - matrix washed away during drilling									210.0
1.0										209.0
2.0										208.0
3.0										207.0
4.0										206.0
5.0	METAMORPHOSED SILTSTONE (BEDROCK) - very fine grained, highly weathered to fresh, very closely to moderately spaced joints, weak (within highly weathered intervals) to very strong, pinkish and greenish dark grey with numerous inclined (45 degrees) pistachio green epidote and pink feldspar bands									205.0
6.0	- from 4.35 to 4.56m, moderately weathered, 20-30mm thick inclined epidote and feldspar bands									204.0
7.0	- at 4.43 and 4.49m, inclined joints with green crust-like chlorite filling									203.0
	- from 4.58 to 4.72m, highly weathered									
	- from 4.72 to 4.9m, moderately weathered									
	- at 4.73, 4.78 and 4.89m, inclined joints with yellow limonite and red oxide fillings (4.73 and 4.78m) and									

EBA ENGINEERING CONSULTANTS LTD. Edmonton, Alberta		LOGGED BY: VER REVIEWED BY: VER Fig. No: 1700127-06	COMPLETION DEPTH: 15 m COMPLETE: 04/10/07
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PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7047766.0 ; E 514082.0

INCLINATION: -90° AZIMUTH: ---

RECORD OF Drillhole: GA-10-21D

DRILLING DATE: March 29, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 1 OF 2

DATUM: NAD83

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	PENETRATION RATE min(m)	FLUSH	RECOVERY	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA	HYDRAULIC CONDUCTIVITY K, m/sec	ROCK STRENGTH INDEX	WEATH- ERING INDEX	NOTES WATER LEVELS INSTRUMENTATION
		Continued from Borehole Log		236.61										
		Dark grey, fresh, very strong, LAPILLI TUFF		0.39										
1					1	100	100	100	100	JN, PL, Ro				
2										JN, UN, Ro				
3					2	100	100	100	100	JN, PL, SM				
4										JN, PL, SM				
5					3	100	100	100	100	JN, CU, Ro				
6														
7										JN, UN, Ro				
8										JN, UN, Ro				
9					4	100	100	100	100					
10														
					5	100	100	100	100					
		CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-RCK 025 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7047071.0 ; E 514218.0

ELEVATION: 216

RECORD OF Borehole: GA-10-18S

DRILLING DATE: March 27, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 1 OF 1

DATUM: NAD83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE			GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s					ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	RECOVERY %	SAMPLE No.		TYPE	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³						
										WATER CONTENT PERCENT						
										Wp -----○ W----- Wi						
									10	20	30	40				
0		GROUND SURFACE		216.00										Stick-up: 0.85m		
	Reamed HW Casing Water	See Borehole log GA-10-18D		0.00										Bentonite		
														Sand		
														27/03/2010 7:45 am		
1														Screen and Sand		
2																
														Sand		
3		END OF BOREHOLE		213.17 2.83												
4																
5																
6																
7																
8																
9																
10																

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-BHS 005 0811180043.GPJ GAL-MISS.GDT 5/11/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7047072.0 ; E 514217.0

ELEVATION: 216

RECORD OF Borehole: GA-10-18D

DRILLING DATE: March 27, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 1 OF 2

DATUM: NAD83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE			GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	RECOVERY %	SAMPLE No.		TYPE	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³					
										WATER CONTENT PERCENT					
										Wp	W	Wi			
									10	20	30	40			
0		GROUND SURFACE		216.00										Stick-up: 0.80m	
	Reamed HW Casing Water	Boulders/cobbles, matrix washed away by drilling - Return water dark brown,		0.00										27/03/2010 At ground surface	
														Open	
1															
2														Bentonite	
3		Dark grey, fresh, strong to very strong, CORDIERITE SCHIST		213.22				See Drillhole GA-10-18D for details							
4				2.78										Caved	
5														Bentonite	
6	HQ Core 76 mm I.D.													Sand	
7															
8														Screen and Sand	
9															
10														Sand	
		CONTINUED NEXT PAGE													

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-BHS 005 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7047072.0 ; E 514217.0

INCLINATION: -90° AZIMUTH: ---

RECORD OF Drillhole: GA-10-18D

DRILLING DATE: March 27, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 1 OF 1

DATUM: NAD83

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	PENETRATION RATE min(m)	FLUSH	COLOUR % RETURN	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate	BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage	PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular	PO - Polished K - Slickensided SM - Smooth Ro - Rough MB - Mechanical Break	BR - Broken Rock VRo - Very Rough NOTE: For additional abbreviations refer to list of abbreviations & symbols.	NOTES WATER LEVELS INSTRUMENTATION																		
				DEPTH										RECOVERY				R.Q.D. %	FRACT INDEX PER 0.3 m	Broken Core	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, m/sec			ROCK STRENGTH INDEX			WEATH- ERING INDEX			
				(m)										TOTAL CORE %	SOLID CORE %		TYPE AND SURFACE DESCRIPTION				10 ⁻⁹	10 ⁻⁸	10 ⁻⁷	10 ⁻⁶	R4	R3	R2	R1	W1	W2	W3	W4
3	HQ Core 76 mm I.D.	Continued from Borehole Log		213.22	1																											
2.78																																
4		Caved																														
5		Bentonite																														
6		Sand																														
7																																
8		Screen and Sand																														
9																																
10		Sand																														
		Caved																														
11	END OF DRILLHOLE		205.52	3	100																											
10.48																																
12																																

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-RCK 025 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7047072.0 ;E 514217.0

ELEVATION: 216

RECORD OF Borehole: GA-10-18D

DRILLING DATE: March 27, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 2 OF 2

DATUM: NAD83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE			GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	RECOVERY %	SAMPLE No.		TYPE	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴			10 ⁻³
										WATER CONTENT PERCENT					
		--- CONTINUED FROM PREVIOUS PAGE ---													
10	HQ Core 76 mm I.D.	Dark grey, fresh, strong to very strong, CORDIERITE SCHIST		205.52 10.48										Stick-up: 0.80m	
		END OF BOREHOLE												Sand Caved 	
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-BHS 005 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7046315.0 ;E

ELEVATION: 224

RECORD OF Borehole: GA-10-27S

DRILLING DATE: April 5, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 1 OF 1

DATUM: NAD83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE			GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	RECOVERY %	SAMPLE No.		TYPE	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³					
										WATER CONTENT PERCENT					
										Wp ———— W ———— WI					
									10	20	30	40			
0		GROUND SURFACE		224.00										Stick-up: 0.87m	
	Reamed HW Casing Water	Boulders/cobbles, matrix washed away by drilling - Coarse to fine SAND, some clay		0.00				Possible Frozen						</	

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-BHS 005 0811180043.GPJ GAL-MISS.GDT 5/11/10 BR

PROJECT: 08-1118-0043 NICO Project

RECORD OF Drillhole: GA-10-27D

SHEET 1 OF 2

LOCATION: N 7046315.0 ;E

DRILLING DATE: April 4-5, 2010

DATUM: NAD83

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	PENETRATION RATE min(m)	FLUSH % RETURN	RECOVERY TOTAL CORE %	R.Q.D. % PER 0.3 m	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, m/sec	ROCK STRENGTH INDEX	WEATH- ERING INDEX	NOTES WATER LEVELS INSTRUMENTATION
		Continued from Borehole Log		220.60										Stick-up: 0.80m
		Dark green with orangey red banding, fresh, very strong, SUBARKOSIC ARENITE		3.40						JN,PL,Ro				Caved
4					1	100				JN,CU,Ro JN,PL,SM JN,PL,Ro JN,PL,SM				
										JN,PL,Ro				
5					2	100				JN,CU,Ro JN,IR,Ro				
6										JN,UN,VRo				
7														Bentonite / Void due to bridging
8										JN,ST,Ro JN,UN,Ro				
9		Orangey red with dark green bands, fresh, very strong, SUBARKOSIC ARENITE with FELDSPAR ALTERATION		215.50 8.50	3	100				JN,UN,Ro JN,UN,Ro JN,UN,Ro JN,PL,Ro JN,UN,Ro JN,PL,SM JN,PL,VRo JN,PL,Ro JN,UN,Ro				
10		Dark green with orangey red banding, fresh, very strong, SUBARKOSIC ARENITE		213.85 10.15						JN,IR,VRo JN,UN,Ro				
11					4	100				JN,UN,VRo				
12														
13					5	100				JN,UN,Ro JN,CU,ST				
		CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-RCK 025 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

RECORD OF Drillhole: GA-10-27D

SHEET 1 OF 2

LOCATION: N 7046315.0 ;E

DRILLING DATE: April 4-5, 2010

DATUM: NAD83

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	PENETRATION RATE min(m)	FLUSH % RETURN	RECOVERY TOTAL CORE %	R.Q.D. % PER 0.3 m	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, m/sec	ROCK STRENGTH INDEX	WEATH- ERING INDEX	NOTES WATER LEVELS INSTRUMENTATION
		Continued from Borehole Log		220.60										Stick-up: 0.80m
		Dark green with orangey red banding, fresh, very strong, SUBARKOSIC ARENITE		3.40						JN,PL,Ro				Caved
4					1	100				JN,CU,Ro JN,PL,SM JN,PL,Ro JN,PL,SM				
										JN,PL,Ro				
5					2	100				JN,CU,Ro JN,IR,Ro				
										JN,UN,VRo				
6														
7														
8										JN,ST,Ro JN,UN,Ro				
9		Orangey red with dark green bands, fresh, very strong, SUBARKOSIC ARENITE with FELDSPAR ALTERATION		215.50 8.50	3	100				JN,UN,Ro JN,UN,Ro JN,UN,Ro JN,PL,Ro JN,UN,Ro JN,PL,SM JN,PL,VRo JN,PL,Ro JN,UN,Ro				
10		Dark green with orangey red banding, fresh, very strong, SUBARKOSIC ARENITE		213.85 10.15						JN,IR,VRo JN,UN,Ro				
11					4	100				JN,UN,VRo				
12														
13					5	100				JN,UN,Ro JN,CU,ST				
		CONTINUED NEXT PAGE												

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-RCK 025 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

LOCATION: N 7046315.0 ;E

ELEVATION: 224

RECORD OF Borehole: GA-10-27D

DRILLING DATE: April 4-5, 2010

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

SHEET 2 OF 2

DATUM: NAD83

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLE			GROUND ICE DESCRIPTION	HYDRAULIC CONDUCTIVITY, k, cm/s					ADDITIONAL LAB. TESTING	NOTES WATER LEVELS INSTRUMENTATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	RUN No.	RECOVERY %	SAMPLE No.		TYPE	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³						
										WATER CONTENT PERCENT						
										Wp	W					Wi
									10	20	30	40				
10		--- CONTINUED FROM PREVIOUS PAGE ---												Stick-up: 0.80m		
	HQ Core	Dark green with orangey red banding, fresh, very strong, SUBARKOSIC ARENITE		213.85 10.15												
11																
12																
13																
14																
15																
		Orangey red with dark green bands, fresh, very strong, SUBARKOSIC ARENITE with FELDSPAR ALTERATION		208.50 15.50										Sand		
16																
17														Screen and Sand		
18		Pink, fresh, strong to very strong, QUARTZ FELDSPAR PORPHYRY		206.75 17.25												
19																
		END OF BOREHOLE		204.86 19.14												
20																

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-BHS 005 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

PROJECT: 08-1118-0043 NICO Project

RECORD OF Drillhole: GA-10-27D

SHEET 2 OF 2

LOCATION: N 7046315.0 ;E

DRILLING DATE: April 4-5, 2010

DATUM: NAD83

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: Diamond

DRILLING CONTRACTOR: Foraco

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	PENETRATION RATE min(m)	COLOUR % RETURN	FLUSH	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate				BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage				PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular				PO - Polished K - Slickensided SM - Smooth Ro - Rough MB - Mechanical Break				BR - Broken Rock VRo - Very Rough NOTE: For additional abbreviations refer to list of abbreviations & symbols.				NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
				DEPTH					RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3 m	Broken Core	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, m/sec	ROCK STRENGTH INDEX			WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
				(m)					TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	DIP wr.t. CORE AXIS		R ₃	R ₂	R ₁	W1	W2	W3	W4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

DEPTH SCALE

1 : 50



LOGGED: I.M. / B.R.

CHECKED: R.W.

MIS-RCK 025 0811180043.GPJ GAL-MISS.GDT 19/10/10 BR

ATTACHMENT 7.III.II

Detailed Results – Groundwater Quality

Attachment 7.III.II-1
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-283	03-283	03-283	03-283	03-283	03-283	Number of Samples	Minimum - 03-283	Maximum - 03-283	Median - 03-283	Average - 03-283
Date			10-Jul-04	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	16-Aug-10	6				
GENERAL PARAMETERS													
pH	pH units		9.4	8.21	8.11	8.23	8.15	8.24	6	8.11	9.4	8.22	8.39
Conductivity	µS/cm		296	363	310	385	222	316	6	222	385	313	315
Alkalinity	mg/L as CaCO ₃		51	99.7	85	96.1	70.4	91.9	6	51	99.7	88.5	82.4
Hardness ²	mg/L as CaCO ₃		54	178	146	178	105	137	6	54	194	142	136
Bicarbonate (HCO ₃)	mg/L		36	122	104	117	85.8	112	6	36	122	108	96
Carbonate (CO ₃)	mg/L		13	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6	13	13	13	13
Total Dissolved Solids (TDS)	mg/L		177	229	180	239	123	186	6	123	239	183	189
ANIONS & NUTRIENTS													
Chloride (Cl)	mg/L	353	5	<0.50	<0.50	0.83	<0.50	<0.50	6	0.50	5.00	2.92	2.92
Sulphate (SO ₄)	mg/L	500	77	86	37	100	37	71	6	37	100	75	74
Fluoride (F)	mg/L		---	0.153	---	0.339	0.147	0.113	4	0.113	0.339	0.150	0.188
Phosphorous (P)	mg/L		0.153	0.185	---	0.11	0.074	0.049	5	0.05	0.19	0.11	0.11
Ammonia (NH ₃)	as N mg/L	0.5	0.11	<0.050	---	<0.050	<0.050	<0.050	5	0.11	0.11	0.11	0.11
Nitrite (NO ₂)	as N mg/L		0.005	<0.050	<0.050	<0.050	0.105	<0.050	6	0.01	0.11	0.06	0.06
Nitrate (NO ₃)	as N mg/L		0.064	<0.050	<0.050	<0.050	<0.050	0.112	6	0.06	0.11	0.09	0.09
DISSOLVED METALS (ICP-MS)													
Aluminum (Al)	mg/L	0.16	---	0.012	0.089	<0.010	0.020	0.007	5	0.007	0.089	0.016	0.032
Antimony (Sb)	mg/L	0.03	---	0.007	0.002	0.009	<0.20	0.006	5	0.002	0.009	0.007	0.006
Arsenic (As)	mg/L	0.05	---	0.150	0.187	0.138	0.159	0.197	5	0.138	0.197	0.159	0.166
Barium (Ba)	mg/L		---	0.0135	0.0186	0.0213	0.00819	<0.01	5	0.0082	0.0213	0.0161	0.0154
Beryllium (Be)	mg/L		---	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050	5	0.0005	0.005	0.0005	0.0015
Bismuth (Bi)	mg/L		---	<0.000050	---	<0.000050	0.000067	<0.000050	4	0.00007	0.00007	0.00007	0.00007
Boron (B)	mg/L		---	0.0152	<0.050	0.0252	0.0066	0.0083	5	0.007	0.03	0.012	0.014
Cadmium (Cd)	mg/L	0.00015	---	0.00033	<0.00006	<0.0001	<0.00005	<0.01	5	0.00005	0.0100	0.0001	0.0021
Calcium (Ca)	mg/L		---	49.9	39.3	54.4	24.4	41.9	5	24.4	54.4	41.9	42.0
Cesium (Cs)	mg/L		---	---	---	---	---	---	0	---	---	---	---
Chromium (Cr)	mg/L		---	<0.00040	<0.0010	<0.00040	<0.0050	<0.0050	5	0.0004	0.005	0.001	0.00236
Cobalt (Co)	mg/L	0.004	---	0.0062	0.0023	0.0050	<0.010	0.0036	5	0.0023	0.0062	0.0043	0.0043
Copper (Cu)	mg/L	0.022	---	0.0052	0.0046	0.0028	0.0150	0.0044	5	0.0028	0.0150	0.0046	0.00641
Iron (Fe)	mg/L		---	---	---	<0.010	0.013	<0.010	3	0.013	0.013	0.013	0.01
Lead (Pb)	mg/L	0.001	---	<0.00010	<0.00010	<0.00010	<0.050	<0.050	5	0.0001	0.05	0.0001	0.02
Lithium (Li)	mg/L		---	0.0051	<0.010	---	0.0041	0.0049	4	0.0041	0.0051	0.0049	0.005
Magnesium (Mg)	mg/L		---	11.9	14.2	14.2	5.47	11.4	5	5.47	14.2	11.5	10.9
Manganese (Mn)	mg/L		---	0.016	0.0112	0.0373	0.0032	0.00118	5	0.00118	0.0373	0.0112	0.0138
Molybdenum (Mo)	mg/L	0.073	---	0.0349	0.0126	0.0200	0.0310	0.0370	5	0.0126	0.0370	0.0310	0.0271
Nickel (Ni)	mg/L		---	0.00186	<0.0020	0.00155	0.00106	0.0092	5	0.00092	0.00186	0.001	0.001
Phosphorous (P)	mg/L		---	3.98	2.97	6.22	<0.010	<0.10	2	0.01	0.055	0.055	0.055
Potassium (K)	mg/L		---	2.97	3.73	3.73	2.97	6.22	2	2.97	6.22	3.73	4.04
Selenium (Se)	mg/L	0.0035	---	<0.00040	<0.00040	<0.00040	<0.00040	0.00081	5	0.00081	0.00081	0.0008	0.0008
Silver (Ag)	mg/L		---	<0.00010	<0.00010	<0.00020	<0.010	<0.00010	5	0.0001	0.01	0.0001	0.002
Sodium (Na)	mg/L		---	2.6	2.3	5.7	0.87	0.74	5	0.74	5.7	2.3	2.4
Strontium (Sr)	mg/L		---	0.0909	0.119	0.0313	0.0438	0.0438	4	0.0313	0.119	0.06735	0.0713
Thallium (Tl)	mg/L		---	0.000063	<0.00010	0.000077	<0.000050	<0.000050	5	0.000063	0.000077	0.00007	0.00007
Tin (Sn)	mg/L		---	<0.00020	<0.050	<0.00020	<0.00020	<0.00020	5	0.0002	0.05	0.0002	0.01
Titanium (Ti)	mg/L		---	0.00072	0.0043	0.00044	<0.010	<0.010	5	0.00044	0.0043	0.00072	0.002
Uranium (U)	mg/L	0.027	---	0.0432	0.0267	0.0598	0.0166	0.0281	5	0.0166	0.0598	0.0281	0.0349
Vanadium (V)	mg/L		---	0.00037	<0.0010	0.00049	<0.0050	0.00018	5	0.00018	0.00049	0.00037	0.0003
Zinc (Zn)	mg/L	0.11	---	0.0021	<0.0040	<0.0010	<0.0050	0.0027	5	0.0021	0.0027	0.0024	0.0024
DISSOLVED METALS (ICP-OES)													
Aluminum (Al)	mg/L	0.16	---	<0.20	---	---	---	---	1	---	---	---	---
Antimony (Sb)	mg/L	0.03	---	<0.20	---	---	---	---	1	---	---	---	---
Arsenic (As)	mg/L	0.05	---	<0.20	---	---	---	---	1	---	---	---	---
Barium (Ba)	mg/L		---	0.014	---	---	---	---	1	---	---	---	---
Beryllium (Be)	mg/L		---	<0.0050	---	---	---	---	1	---	---	---	---
Bismuth (Bi)	mg/L		---	<0.20	---	---	---	---	1	---	---	---	---
Boron (B)	mg/L		---	<0.10	---	---	---	---	1	---	---	---	---
Cadmium (Cd)	mg/L	0.00015	---	<0.010	---	---	---	---	1	---	---	---	---
Calcium (Ca)	mg/L		---	51.3	---	---	---	---	1	---	---	---	---
Chromium (Cr)	mg/L		---	<0.0050	---	---	---	---	1	---	---	---	---
Cobalt (Co)	mg/L	0.004	---	<0.010	---	---	---	---	1	---	---	---	---
Copper (Cu)	mg/L	0.022	---	<0.010	---	---	---	---	1	---	---	---	---
Iron (Fe)	mg/L		---	<0.010	---	---	---	---	1	---	---	---	---
Lead (Pb)	mg/L	0.001	---	<0.050	---	---	---	---	1	---	---	---	---
Lithium (Li)	mg/L		---	<0.010	---	---	---	---	1	---	---	---	---
Magnesium (Mg)	mg/L		---	12.1	---	---	---	---	1	---	---	---	---
Manganese (Mn)	mg/L		---	0.016	---	---	---	---	1	---	---	---	---
Molybdenum (Mo)	mg/L	0.073	---	0.044	---	---	---	---	1	---	---	---	---
Nickel (Ni)	mg/L		---	<0.050	---	---	---	---	1	---	---	---	---
Potassium (K)	mg/L		---	4.3	---	---	---	---	1	---	---	---	---
Selenium (Se)	mg/L	0.0035	---	<0.20	---	---	---	---	1	---	---	---	---
Silicon (Si)	mg/L		---	3.51	---	---	---	---	1	---	---	---	---
Silver (Ag)	mg/L		---	<0.010	---	---	---	---	1	---	---	---	---
Sodium (Na)	mg/L		---	2.6	---	---	---	---	1	---	---	---	---
Strontium (Sr)	mg/L		---	0.0984	---	---	---	---	1	---	---	---	---
Sulfur (S)	mg/L		---	28.6	---	---	---	---	1	---	---	---	---
Thallium (Tl)	mg/L		---	<0.20	---	---	---	---	1	---	---	---	---
Tin (Sn)	mg/L		---	<0.030	---	---	---	---	1	---	---	---	---
Titanium (Ti)	mg/L	0.027	---	<0.010	---	---	---	---	1	---	---	---	---
Vanadium (V)	mg/L		---	<0.0050	---	---	---	---	1	---	---	---	---
Zinc (Zn)	mg/L	0.11	---	<0.0050	---	---	---	---	1	---	---	---	---

Attachment 7.III.II-1
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-283	03-283	03-283	03-283	03-283	03-283	Number of Samples	Minimum - 03-283	Maximum - 03-283	Median - 03-283	Average - 03-283
Date			10-Jul-04	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	16-Aug-10	6				
TOTAL METALS (ICP-MS)													
Aluminum (Al)	mg/L	0.16	0.04	5.7	2.8	0.219	2.3	1.3	6	0.04	5.7	2.3	2.4
Antimony (Sb)	mg/L	0.03	0.0127	0.0063	0.0027	0.00128	<0.20	0.0055	6	0.0027	0.0127	0.0059	0.007
Arsenic (As)	mg/L	0.05	0.27	0.26	0.28	0.129	0.21	0.23	6	0.21	0.28	0.26	0.25
Barium (Ba)	mg/L		0.0186	0.054	0.0335	0.0461	0.0244	0.0121	6	0.0121	0.054	0.0244	0.029
Beryllium (Be)	mg/L		<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	6	0.0005	0.001	0.001	0.0009
Bismuth (Bi)	mg/L		0.00009	0.027	---	0.00056	0.0111	<0.20	5	0.00009	0.027	0.011	0.01
Boron (B)	mg/L		0.097	0.0189	<0.050	0.028	<0.10	0.0093	6	0.0093	0.097	0.0189	0.04
Cadmium (Cd)	mg/L	0.00015	0.0002	0.0007	0.0001	0.00038	0.0001	0.0001	6	0.0001	0.0007	0.0001	0.0002
Calcium (Ca)	mg/L		12.6	52.2	47.8	42.5	25.6	47.2	6	12.6	52.2	47.2	37.1
Cesium	mg/L		0.0001	---	---	---	---	---	1	---	---	---	---
Chromium (Cr)	mg/L		0.0008	0.00474	0.0029	0.00276	0.0014	0.00136	6	0.0008	0.0047	0.0014	0.002
Cobalt (Co)	mg/L	0.004	0.0079	0.0418	0.0208	0.00057	0.0186	0.00927	6	0.0079	0.0418	0.0186	0.0197
Copper (Cu)	mg/L	0.022	0.017	0.110	0.051	0.0089	0.060	0.033	6	0.017	0.110	0.051	0.054
Iron (Fe)	mg/L		0.073	---	8.11	0.365	4.21	4.17	5	0.073	8.11	4.19	4.14
Lead (Pb)	mg/L	0.001	0.0002	0.007	0.003	0.00116	0.003	<0.050	6	0.0002	0.007	0.003	0.003
Lithium (Li)	mg/L		0.0069	0.0073	<0.010	---	<0.0060	<0.0060	5	0.0069	0.0073	0.0071	0.007
Magnesium (Mg)	mg/L		5.4	15	16.5	9.49	7.6	11.4	6	5.4	16.5	11.4	11.2
Manganese (Mn)	mg/L		0.012	0.132	0.117	0.0076	0.0501	0.0247	6	0.012	0.132	0.0501	0.067
Molybdenum (Mo)	mg/L	0.073	0.034	0.032	0.013	0.0354	0.044	0.036	6	0.013	0.044	0.034	0.032
Nickel (Ni)	mg/L		0.0018	0.00959	0.0045	0.00589	<0.050	0.00281	6	0.0018	0.0096	0.0037	0.005
Potassium (K)	mg/L		12	6.48	4.72	1.64	0.063	3.66	6	0.063	12	4.72	5.4
Rubidium	mg/L		<0.05	---	---	---	4.3	---	2	4.3	4.3	4.3	4.3
Selenium (Se)	mg/L	0.0035	<0.0004	0.0004	<0.00040	<0.00040	<0.00040	0.0007	6	0.0004	0.0007	0.0006	0.0006
Silver (Ag)	mg/L		<0.0002	0.0219	0.00891	<0.00040	0.00611	0.00274	6	0.00274	0.0219	0.00751	0.010
Sodium (Na)	mg/L		34	2.7	2.8	11.8	<1.0	1	6	1	34	2.75	10.1
Strontium (Sr)	mg/L		0.144	0.0987	---	0.236	0.0336	0.0533	5	0.0336	0.144	0.076	0.082
Thallium (Tl)	mg/L		<0.00005	0.00019	<0.00010	<0.00010	<0.00010	<0.00010	6	0.00019	0.00019	0.00019	0.0002
Tin (Sn)	mg/L		0.0002	0.00057	<0.050	0.00078	<0.030	<0.030	6	0.0002	0.00057	0.0004	0.00
Titanium (Ti)	mg/L		0.0018	0.192	0.14	0.0073	0.089	0.0728	6	0.0018	0.192	0.089	0.099
Uranium (U)	mg/L	0.027	0.094	0.046	0.003	0.0244	0.018	0.031	6	0.003	0.09	0.03	0.04
Vanadium (V)	mg/L		0.0061	0.00564	0.0115	0.00176	<0.0050	0.00186	6	0.00186	0.0115	0.00587	0.006
Zinc (Zn)	mg/L	0.11	0.017	0.034	0.012	0.0109	<0.0050	0.008	6	0.008	0.034	0.014	0.017
TOTAL METALS (ICP-OES)													
Aluminum (Al)	mg/L	0.16	---	6.06	---	---	---	---	1	---	---	---	---
Antimony (Sb)	mg/L	0.03	---	<0.20	---	---	---	---	1	---	---	---	---
Arsenic (As)	mg/L	0.05	---	0.3	---	---	---	---	1	---	---	---	---
Barium (Ba)	mg/L		---	0.0604	---	---	---	---	1	---	---	---	---
Beryllium (Be)	mg/L		---	<0.0050	---	---	---	---	1	---	---	---	---
Bismuth (Bi)	mg/L		---	<0.20	---	---	---	---	1	---	---	---	---
Boron (B)	mg/L		---	<0.10	---	---	---	---	1	---	---	---	---
Cadmium (Cd)	mg/L	0.00015	---	<0.010	---	---	---	---	1	---	---	---	---
Calcium (Ca)	mg/L		---	54	---	---	---	---	1	---	---	---	---
Chromium (Cr)	mg/L		---	0.0054	---	---	---	---	1	---	---	---	---
Cobalt (Co)	mg/L	0.004	---	0.044	---	---	---	---	1	---	---	---	---
Copper (Cu)	mg/L	0.022	---	0.123	---	---	---	---	1	---	---	---	---
Iron (Fe)	mg/L		---	10.2	---	---	---	---	1	---	---	---	---
Lead (Pb)	mg/L	0.001	---	<0.050	---	---	---	---	1	---	---	---	---
Lithium (Li)	mg/L		---	<0.010	---	---	---	---	1	---	---	---	---
Magnesium (Mg)	mg/L		---	16	---	---	---	---	1	---	---	---	---
Manganese (Mn)	mg/L		---	0.135	---	---	---	---	1	---	---	---	---
Molybdenum (Mo)	mg/L	0.073	---	0.043	---	---	---	---	1	---	---	---	---
Nickel (Ni)	mg/L		---	<0.050	---	---	---	---	1	---	---	---	---
Potassium (K)	mg/L		---	6.49	---	---	---	---	1	---	---	---	---
Selenium (Se)	mg/L	0.0035	---	<0.20	---	---	---	---	1	---	---	---	---
Silicon (Si)	mg/L		---	16.2	---	---	---	---	1	---	---	---	---
Silver (Ag)	mg/L		---	0.022	---	---	---	---	1	---	---	---	---
Sodium (Na)	mg/L		---	---	---	---	---	---	0	---	---	---	---
Strontium (Sr)	mg/L		---	0.106	---	---	---	---	1	---	---	---	---
Sulfur (S)	mg/L		---	26	---	---	---	---	1	---	---	---	---
Thallium (Tl)	mg/L		---	<0.20	---	---	---	---	1	---	---	---	---
Tin (Sn)	mg/L		---	<0.030	---	---	---	---	1	---	---	---	---
Titanium (Ti)	mg/L		---	0.2	---	---	---	---	1	---	---	---	---
Vanadium (V)	mg/L		---	0.0057	---	---	---	---	1	---	---	---	---
Zinc (Zn)	mg/L	0.11	---	0.0352	---	---	---	---	1	---	---	---	---

Notes:

0.3 indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-282	03-282	03-282	03-282	03-282	03-282	03-282	03-282	03-282	Number of Samples	Minimum - 03-282	Maximum - 03-282	Median - 03-282	Average - 03-282
Date			10-Jul-04	10-Jul-04	31-Aug-09	6-Apr-10	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	17-Aug-10	9				
GENERAL PARAMETERS																
pH	pH units		11.1	11.1	9.65	10.6	10.01	8.57	9.11	9.42	9.19	9	8.57	11.1	9.65	9.86
Conductivity	µS/cm		290	307	206	275	244	357	244	180	218	9	180	500	275	286
Alkalinity	mg/L as CaCO ₃		91	95	40.8	51.7	150	113	69.1	31.8	49.3	9	31.8	150	69.1	77
Hardness ²	mg/L as CaCO ₃		87	90	64.8	70.7	38.8	41.7	102	64.5	81.5	9	38.8	102	70.7	71
Bicarbonate (HCO ₃)	mg/L		< 5	< 5	18.9	< 5.0	77.3	128	64.6	16	26.1	9	16	128	45.35	55
Carbonate (CO ₃)	mg/L		24	24	15.2	17.4	51.9	5	9.7	11.2	16.8	9	5	51.9	16.8	19
Total Dissolved Solids (TDS)	mg/L		147	149	134	129	315	209	146	87	129	9	87	315	146	161
ANIONS & NUTRIENTS																
Chloride (Cl)	mg/L	353	2	1	<0.50	0.56	1.26	0.78	0.53	<0.50	<0.50	9	0.53	2.00	0.89	1.02
Sulphate (SO ₄)	mg/L	500	36	35	56	53	114	63	52	48	57	9	35	114	53	57
Fluoride (F)	mg/L				0.514		1.98	---	0.444	0.428	0.525	5	0.428	1.98	0.514	0.778
Phosphorous (P)	mg/L		0.012	0.01	<0.020	---	0.373	---	0.04	<0.020	<0.020	7	0.01	0.373	0.026	0.11
Ammonia (NH ₃)	as N mg/L	0.5	0.036	0.032	<0.050	---	0.071	---	<0.050	<0.050	<0.050	7	0.032	0.071	0.036	0.046
Nitrite (NO ₂)	as N mg/L		<0.002	0.002	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	9	0.002	0.002	0.002	0.00
Nitrate (NO ₃)	as N mg/L		0.021	0.022	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	9	0.021	0.022	0.0215	0.02
DISSOLVED METALS (ICP-MS)																
Aluminum (Al)	mg/L	0.16	---	---	0.006	<0.0050	0.185	0.057	0.012	0.028	0.009	7	0.006	0.185	0.028	0.058
Antimony (Sb)	mg/L	0.03	---	---	0.0006	0.0006	0.0024	0.0025	0.0010	<0.20	<0.20	7	0.0006	0.0025	0.0010	0.0014
Arsenic (As)	mg/L	0.05	---	---	0.084	0.036	0.323	0.410	0.095	<0.20	0.093	7	0.036	0.410	0.095	0.190
Barium (Ba)	mg/L	---	---	---	0.021	0.0268	0.0151	0.0279	0.0318	0.015	0.021	7	0.015	0.0318	0.024	0.023
Beryllium (Be)	mg/L	---	---	---	<0.00050	<0.0010	<0.00050	<0.0010	<0.00050	<0.0050	<0.00050	7	0.0005	0.005	0.0005	0.001
Bismuth (Bi)	mg/L	---	---	---	<0.00050	---	0.000394	---	<0.00050	<0.20	<0.00050	5	0.000394	0.000394	0.0039	0.0004
Boron (B)	mg/L	---	---	---	0.03	<0.050	0.109	0.105	0.0296	<0.10	0.022	7	0.022	0.109	0.03	0.06
Cadmium (Cd)	mg/L	0.00015	---	---	0.00026	0.00009	0.00018	0.00001	<0.0010	<0.010	<0.010	7	0.00001	0.0003	0.0001	0.0001
Calcium (Ca)	mg/L	---	---	---	17.7	24.1	13.3	9.82	26.4	16.5	25.3	7	9.82	26.4	17.1	18.0
Cesium (Cs)	mg/L	---	---	---	---	---	---	---	---	---	---	0	---	---	---	---
Chromium (Cr)	mg/L	---	---	---	0.00343	0.0045	0.00221	<0.0010	0.0006	0.00189	0.0018	7	0.0006	0.0045	0.002	0.003
Cobalt (Co)	mg/L	0.004	---	---	<0.00010	<0.0020	0.00035	<0.0020	0.00011	<0.010	<0.010	7	0.0001	0.0004	0.0002	0.0002
Copper (Cu)	mg/L	0.022	---	---	0.00167	<0.0010	0.00461	0.00170	0.00212	<0.010	0.00130	7	0.00167	0.00461	0.002	0.003
Iron (Fe)	mg/L	---	---	---	---	---	<0.010	---	<0.010	<0.010	<0.010	4	0.01	0.01	0.01	0.01
Lead (Pb)	mg/L	0.001	---	---	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.050	<0.050	7	0.0001	0.05	0.0001	0.01
Lithium (Li)	mg/L	---	---	---	0.0064	0.0157	<0.010	<0.010	0.0048	0.0058	0.0058	6	0.0048	0.0157	0.0064	0.009
Magnesium (Mg)	mg/L	---	---	---	4.43	2.53	0.889	4.18	8.78	4.2	6.69	7	0.889	8.78	4.19	4.2
Manganese (Mn)	mg/L	---	---	---	0.00027	<0.0050	0.0035	0.0072	<0.0020	<0.00020	<0.0020	7	0.00027	0.0072	0.0035	0.0037
Molybdenum (Mo)	mg/L	0.073	---	---	0.054	0.052	0.038	<0.0050	0.037	0.032	0.032	7	0.0315	0.054	0.0378	0.0425
Nickel (Ni)	mg/L	---	---	---	0.0005	<0.0020	0.00144	<0.0020	0.0008	0.00045	0.00048	7	0.00045	0.00144	0.00065	0.00080
Phosphorous (P)	mg/L	---	---	---	---	---	<0.010	---	---	<0.10	<0.010	3	0.01	0.1	0.01	0.04
Potassium (K)	mg/L	---	---	---	1.9	2.32	8.42	2.9	2.05	1.72	1.71	7	1.72	8.42	2.185	3.22
Selenium (Se)	mg/L	0.0035	---	---	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.20	<0.00040	7	0.0004	0.2	0.0004	0.029
Silver (Ag)	mg/L	---	---	---	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.010	<0.010	7	0.0001	0.01	0.0001	0.003
Sodium (Na)	mg/L	---	---	---	16	15.1	90.9	61	14.3	12	90.9	7	12	90.9	15.55	34.9
Strontium (Sr)	mg/L	---	---	---	0.181	---	0.0982	---	0.191	0.14	0.182	5	0.0982	0.191	0.161	0.153
Thallium (Tl)	mg/L	---	---	---	<0.000050	<0.00010	<0.000050	<0.00010	<0.000050	<0.20	<0.000050	7	0.00005	0.2	0.00005	0.02863
Tin (Sn)	mg/L	---	---	---	<0.00020	<0.050	0.00038	<0.050	<0.00020	<0.00020	<0.030	7	0.00038	0.00038	0.0004	0.0004
Titanium (Ti)	mg/L	---	---	---	0.00062	<0.0010	0.00304	0.0013	0.00053	<0.010	<0.010	7	0.00053	0.00304	0.00096	0.0014
Uranium (U)	mg/L	0.027	---	---	0.0076	0.0009	0.0027	0.0046	0.0263	0.0128	0.0137	7	0.0009	0.0263	0.0061	0.0092
Vanadium (V)	mg/L	---	---	---	0.00168	0.002	0.00278	<0.0010	0.0012	<0.0050	<0.0050	7	0.0012	0.00278	0.0018	0.002
Zinc (Zn)	mg/L	0.11	---	---	0.0016	0.0079	0.0023	0.0064	0.0013	<0.0010	<0.0050	7	0.0013	0.0079	0.002	0.004
DISSOLVED METALS (ICP-OES)																
Aluminum (Al)	mg/L	0.16	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Antimony (Sb)	mg/L	0.03	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Arsenic (As)	mg/L	0.05	---	---	<0.20	---	0.36	---	---	---	---	2	0.2	0.36	0.28	0.3
Barium (Ba)	mg/L	---	---	---	0.021	---	0.018	---	---	---	---	2	0.018	0.021	0.0195	0.020
Beryllium (Be)	mg/L	---	---	---	<0.0050	---	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.01
Bismuth (Bi)	mg/L	---	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Boron (B)	mg/L	---	---	---	<0.10	---	0.13	---	---	---	---	2	0.1	0.13	0.115	0.1
Cadmium (Cd)	mg/L	0.00015	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Calcium (Ca)	mg/L	---	---	---	18.4	---	13.9	---	---	---	---	2	13.9	18.4	16.15	16.2
Chromium (Cr)	mg/L	---	---	---	<0.0050	---	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Cobalt (Co)	mg/L	0.004	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Copper (Cu)	mg/L	0.022	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Iron (Fe)	mg/L	---	---	---	<0.010	---	0.307	---	---	---	---	2	0.01	0.307	0.1585	0.2
Lead (Pb)	mg/L	0.001	---	---	<0.050	---	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Lithium (Li)	mg/L	---	---	---	<0.010	---	0.016	---	---	---	---	2	0.01	0.016	0.013	0.01
Magnesium (Mg)	mg/L	---	---	---	4.6	---	1	---	---	---	---	2	1	4.6	2.8	2.8
Manganese (Mn)	mg/L	---	---	---	<0.0020	---	0.00375	---	---	---	---	2	0.002	0.00375	0.002875	0.003
Molybdenum (Mo)	mg/L	0.073	---	---	0.0552	---	0.038	---	---	---	---	2	0.038	0.0552	0.0466	0.047
Nickel (Ni)	mg/L	---	---	---	<0.050	---	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Potassium (K)	mg/L	---	---	---	2.08	---	9.21	---	---	---	---	2	2.08	9.21	5.645	5.65
Selenium (Se)	mg/L	0.0035	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Silicon (Si)	mg/L	---	---	---	4.36	---	4.82	---	---	---	---	2	4.36	4.82	4.59	4.59
Silver (Ag)	mg/L	---	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Sodium (Na)	mg/L	---	---	---	16	---	90.9	---	---	---	---	2	16	90.9	53.45	53
Strontium (Sr)	mg/L	---	---	---	0.193	---	0.0996	---	---	---	---	2	0.0996	0.193	0.1463	0.146
Sulfur (S)	mg/L	---	---	---	18.8	---	37.4	---	---	---	---	2	18.8	37.4	28.1	28.1
Thallium (Tl)	mg/L	---	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Tin (Sn)	mg/L	---	---	---	<0.030	---	<0.030	---	---	---	---	2	0.03	0.03	0.03	0.03
Titanium (Ti)	mg/L	0.027	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Vanadium (V)	mg/L	---	---	---	<0.0050	---	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Zinc (Zn)	mg/L	0.11	---	---	<0.0050	---	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005

Attachment 7.III.II-2
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-282	03-282	03-282	03-282	03-282	03-282	03-282	03-282	03-282	Number of Samples	Minimum - 03-282	Maximum - 03-282	Median - 03-282	Average - 03-282
Date			10-Jul-04	10-Jul-04	31-Aug-09	6-Apr-10	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	17-Aug-10	9				
Beryllium (Be)	mg/L		<0.0005	<0.0005	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	9	0.0005	0.001	0.001	0.0009
Bismuth (Bi)	mg/L		<0.00005	<0.00005	<0.00020	---	0.0181	---	0.00067	<0.20	<0.00020	7	0.00005	0.2	0.0002	0.03
Boron (B)	mg/L		0.037	0.036	0.0567	<0.050	0.13	0.099	0.027	0.0214	0.0289	9	0.0214	0.13	0.037	0.05
Cadmium (Cd)	mg/L	0.00015	<0.0001	<0.0001	0.0002	0.0001	0.0011	0.0000	0.0004	<0.010	<0.010	9	0.0000	0.0100	0.0002	0.0004
Calcium (Ca)	mg/L		33.3	34.6	18.1	24.6	41.1	9.52	46.7	32.5	25.3	9	9.52	46.7	32.5	29.5
Cesium	mg/L		0.0001	0.0001	---	---	---	---	---	---	---	2	0.0001	0.0001	0.0001	0.0001
Chromium (Cr)	mg/L		0.0091	0.0086	0.00343	0.0043	0.0245	<0.0010	0.00296	<0.0050	0.00175	9	0.001	0.0245	0.0043	0.007
Cobalt (Co)	mg/L	0.004	0.0014	0.0007	<0.00020	<0.0020	0.0078	<0.0020	0.0006	<0.010	<0.00020	9	0.0002	0.0100	0.0014	0.0028
Copper (Cu)	mg/L	0.022	0.005	0.002	0.002	<0.0010	0.024	0.002	0.009	0.003	<0.010	9	0.001	0.024	0.003	0.006
Iron (Fe)	mg/L		0.019	0.035	---	<0.030	---	0.178	0.438	0.037	<0.010	7	0.01	0.438	0.035	0.11
Lead (Pb)	mg/L	0.001	0.000	0.000	0.000	<0.00010	0.004	<0.00010	0.001	<0.00010	<0.00010	9	0.000	0.004	0.000	0.001
Lithium (Li)	mg/L		0.0069	0.007	0.0088	0.010	0.0142	<0.010	---	<0.010	<0.010	8	0.0069	0.0142	0.01	0.010
Magnesium (Mg)	mg/L		0.9	0.9	4.41	2.59	2.25	4.04	10.3	3.48	6.39	9	0.9	10.3	3.48	3.9
Manganese (Mn)	mg/L		0.003	0.003	0.00049	<0.0050	0.125	0.0076	0.0084	<0.0020	0.00055	9	0.00049	0.125	0.003	0.017
Molybdenum (Mo)	mg/L	0.073	0.034	0.025	0.050	0.051	0.037	<0.0050	0.036	0.032	0.033	9	0.005	0.051	0.034	0.034
Nickel (Ni)	mg/L		0.0006	0.0002	0.00044	<0.0020	0.00992	<0.0020	0.00656	0.00109	0.00087	9	0.0002	0.00992	0.00109	0.0026
Potassium (K)	mg/L		2.8	2.6	1.86	2.04	9.13	2.91	1.82	1.58	1.76	9	1.58	9.13	2.04	2.9
Rubidium	mg/L		<0.05	<0.05	---	---	---	---	---	---	---	2	0.05	0.05	0.05	0.1
Selenium (Se)	mg/L	0.0035	<0.0004	<0.0004	<0.00040	<0.00040	0.0005	<0.00040	<0.00040	<0.00040	<0.00040	9	0.0004	0.0005	0.0004	0.0004
Silver (Ag)	mg/L		<0.0002	<0.0002	<0.00010	<0.00010	0.00122	<0.00010	<0.00010	<0.00010	<0.00010	9	0.0001	0.01	0.0002	0.001
Sodium (Na)	mg/L		18	18	15.1	15.3	87.2	62.4	12.4	9.47	12.3	9	9.47	87.2	15.3	27.8
Strontium (Sr)	mg/L		0.189	0.191	0.176	---	0.129	---	0.234	0.163	0.189	7	0.129	0.234	0.189	0.182
Thallium (Tl)	mg/L		<0.00005	<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.20	9	0.00005	0.2	0.0001	0.0223
Tin (Sn)	mg/L		0.0002	<0.0002	<0.00040	<0.050	0.00202	<0.050	0.00088	<0.030	<0.030	9	0.0002	0.05	0.00202	0.02
Titanium (Ti)	mg/L		0.0003	0.0004	0.00136	<0.0010	0.0821	0.0017	0.0076	0.00122	<0.010	9	0.0003	0.0821	0.00136	0.012
Uranium (U)	mg/L	0.027	0.0003	0.0005	0.0086	0.0013	0.0037	0.0051	0.0280	0.0096	0.0143	9	0.0003	0.0280	0.0051	0.01
Vanadium (V)	mg/L		0.0021	0.002	0.00169	0.002	0.00765	<0.0010	0.00182	<0.0050	0.00168	9	0.001	0.00765	0.002	0.003
Zinc (Zn)	mg/L	0.11	0.007	0.007	<0.0040	0.015	0.054	0.006	0.012	<0.0040	<0.0050	9	0.004	0.054	0.007	0.013
TOTAL METALS (ICP-OES)																
Aluminum (Al)	mg/L	0.16	---	---	<0.20	---	1.89	---	---	---	---	2	0.2	1.89	1.045	1.0
Antimony (Sb)	mg/L	0.03	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Arsenic (As)	mg/L	0.05	---	---	<0.20	---	0.85	---	---	---	---	2	0.2	0.85	0.525	0.5
Barium (Ba)	mg/L		---	---	0.0224	---	0.0976	---	---	---	---	2	0.0224	0.0976	0.06	0.06
Beryllium (Be)	mg/L		---	---	<0.0050	---	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Bismuth (Bi)	mg/L		---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Boron (B)	mg/L		---	---	<0.10	---	<0.10	---	---	---	---	2	0.1	0.1	0.1	0.1
Cadmium (Cd)	mg/L	0.00015	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Calcium (Ca)	mg/L		---	---	18.2	---	43.1	---	---	---	---	2	18.2	43.1	30.65	30.7
Chromium (Cr)	mg/L		---	---	<0.0050	---	0.0261	---	---	---	---	2	0.005	0.0261	0.01555	0.02
Cobalt (Co)	mg/L	0.004	---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Copper (Cu)	mg/L	0.022	---	---	<0.010	---	0.029	---	---	---	---	2	0.01	0.029	0.0195	0.02
Iron (Fe)	mg/L		---	---	0.026	---	18	---	---	---	---	2	0.026	18	9.013	9
Lead (Pb)	mg/L	0.001	---	---	<0.050	---	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Lithium (Li)	mg/L		---	---	<0.010	---	0.016	---	---	---	---	2	0.01	0.016	0.013	0.01
Magnesium (Mg)	mg/L		---	---	4.43	---	2.47	---	---	---	---	2	2.47	4.43	3.45	3.45
Manganese (Mn)	mg/L		---	---	<0.0020	---	0.131	---	---	---	---	2	0.002	0.131	0.0665	0.07
Molybdenum (Mo)	mg/L	0.073	---	---	0.0538	---	0.047	---	---	---	---	2	0.047	0.0538	0.0504	0.050
Nickel (Ni)	mg/L		---	---	<0.050	---	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Potassium (K)	mg/L		---	---	1.95	---	9.17	---	---	---	---	2	1.95	9.17	5.56	5.56
Selenium (Se)	mg/L	0.0035	---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Silicon (Si)	mg/L		---	---	4.26	---	12.3	---	---	---	---	2	4.26	12.3	8.28	8.28
Silver (Ag)	mg/L		---	---	<0.010	---	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Sodium (Na)	mg/L		---	---	15.1	---	---	---	---	---	---	1	---	---	---	---
Strontium (Sr)	mg/L		---	---	0.186	---	0.136	---	---	---	---	2	0.136	0.186	0.161	0.161
Sulfur (S)	mg/L		---	---	17.4	---	41.6	---	---	---	---	2	17.4	41.6	29.5	29.5
Thallium (Tl)	mg/L		---	---	<0.20	---	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Tin (Sn)	mg/L		---	---	<0.030	---	<0.030	---	---	---	---	2	0.03	0.03	0.03	0.03
Titanium (Ti)	mg/L		---	---	<0.010	---	0.085	---	---	---	---	2	0.01	0.085	0.0475	0.05
Vanadium (V)	mg/L		---	---	<0.0050	---	0.0078	---	---	---	---	2	0.005	0.0078	0.0064	0.006
Zinc (Zn)	mg/L	0.11	---	---	<0.0050	---	0.0586	---	---	---	---	2	0.005	0.0586	0.0318	0.03

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-281	03-281	03-281	03-281	03-281	03-281	03-281	Number of Samples	Minimum - 03-281	Maximum - 03-281	Median - 03-281	Average - 03-281
Date			10-Jul-04	30-Aug-09	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	17-Aug-10	7				
GENERAL PARAMETERS														
pH	pH units		8.3	10.07	10.01	8.6	8.2	8.2	8.2	7	8.2	10.1	8.3	8.8
Conductivity	µS/cm		258	493	500	357	239	267	243	7	239	500	267	337
Alkalinity	mg/L as CaCO ₃		88	126	150	113	88.1	91.2	84	7	84	150	91.2	106
Hardness ²	mg/L as CaCO ₃		104	35.8	38.8	41.7	105	120	89.3	7	35.8	120	89.3	76
Bicarbonate (HCO ₃)	mg/L		107	53	77.3	128	107	111	102	7	53	128	107	98
Carbonate (CO ₃)	mg/L		< 5	49.3	51.9	5	< 5	< 5	< 5	7	5	51.9	5	18
Total Dissolved Solids (TDS)	mg/L		148	324	315	209	133	162	137	7	133	324	162	204
ANIONS & NUTRIENTS														
Chloride (Cl)	mg/L	353	2	1.15	1.26	0.78	<0.50	<0.50	0.68	7	0.50	2.00	0.78	0.98
Sulphate (SO ₄)	mg/L	500	41.9	114	114	63	32.1	39.4	38	7	32	114	42	63
Fluoride (F)	mg/L			1.97	1.98		0.377	0.401	0.452	5	0.377	1.98	0.452	1.036
Phosphorous (P)	mg/L		0.089	0.368	0.373		0.179	0.057	0.101	6	0.057	0.373	0.14	0.19
Ammonia (NH ₃)	as N mg/L	0.5	0.011	0.07	0.071		<0.050	<0.050	<0.050	6	0.011	0.071	0.050	0.050
Nitrite (NO ₂)	as N mg/L		0.006	<0.050	<0.050	<0.050	<0.050	0.186	<0.050	7	0.006	0.186	0.05	0.06
Nitrate (NO ₃)	as N mg/L		0.291	<0.050	<0.050	<0.050	0.165	<0.050	0.258	7	0.05	0.291	0.05	0.13
DISSOLVED METALS (ICP-MS)														
Aluminum (Al)	mg/L	0.16	---	0.185	0.185	0.0573	0.015	<0.20	<0.20	6	0.057	0.200	0.2	0.2
Antimony (Sb)	mg/L	0.03	---	0.00237	0.00238	0.00251	0.00346	0.00327	0.00277	6	0.0024	0.0035	0.0026	0.0028
Arsenic (As)	mg/L	0.05	---	0.321	0.323	0.410	0.900	0.920	0.710	6	0.321	0.920	0.560	0.597
Barium (Ba)	mg/L		---	0.014	0.0151	0.0279	0.0152	0.0129	0.00846	6	0.00846	0.0279	0.0146	0.0156
Beryllium (Be)	mg/L		---	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050	6	0.0005	0.005	0.0008	0.002
Bismuth (Bi)	mg/L		---	0.000394	0.000394		0.000113	<0.20	<0.20	5	0.000113	0.2	0.0004	0.08
Boron (B)	mg/L		---	0.1	0.109	0.105	0.0256	<0.10	0.0215	6	0.0215	0.109	0.1	0.077
Cadmium (Cd)	mg/L	0.00015	---	0.00018	0.000178	0.000012	<0.00010	<0.00050	<0.00050	6	0.00001	0.0002	0.0001	0.0001
Calcium (Ca)	mg/L		---	12.8	13.3	9.82	18.6	21.2	17.2	6	9.82	21.2	15.25	15.5
Cesium (Cs)	mg/L		---	---	---	---	---	---	---	0	---	---	---	---
Chromium (Cr)	mg/L		---	0.00221	0.00221	<0.0010	<0.00040	<0.0050	<0.00040	6	0.0004	0.005	0.002	0.002
Cobalt (Co)	mg/L	0.004	---	0.00035	0.0004	<0.0020	0.0041	0.0038	<0.010	6	0.0004	0.0100	0.003	0.003
Copper (Cu)	mg/L	0.022	---	0.00444	0.00461	0.0017	0.00864	0.00666	0.00606	6	0.00170	0.00864	0.00534	0.00535
Iron (Fe)	mg/L		---	---	---	---	0.086	0.075	0.039	3	0.039	0.086	0.075	0.07
Lead (Pb)	mg/L	0.001	---	<0.00010	<0.00010	<0.00010	<0.00010	<0.050	<0.050	6	0.00	0.05	0.0001	0.02
Lithium (Li)	mg/L		---	0.015	0.0157	<0.010	---	<0.010	<0.010	5	0.01	0.0157	0.01	0.012
Magnesium (Mg)	mg/L		---	0.91	0.889	4.18	14.1	11.7	13.7	6	0.889	14.1	7.94	7.6
Manganese (Mn)	mg/L		---	0.0032	0.0035	0.0072	0.0135	0.0181	0.0195	6	0.0032	0.0195	0.0104	0.0108
Molybdenum (Mo)	mg/L	0.073	---	0.033	0.0378	<0.0050	0.00435	<0.030	0.0105	6	0.0044	0.038	0.02	0.02
Nickel (Ni)	mg/L		---	0.00144	0.00144	<0.0020	0.00081	<0.050	<0.050	6	0.00081	0.05	0.002	0.02
Phosphorous (P)	mg/L		---	---	---	---	---	<0.10	<0.10	2	0.1	0.1	0.1	0.1
Potassium (K)	mg/L		---	8.31	8.42	2.9	4.76	4.09	4.2	6	2.9	8.42	4.48	5.45
Selenium (Se)	mg/L	0.0035	---	<0.00040	<0.00040	<0.00040	0.00043	0.00063	0.0005	6	0.0004	0.00063	0.0004	0.0005
Silver (Ag)	mg/L		---	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	6	0.0001	0.0002	0.0001	0.0001
Sodium (Na)	mg/L		---	87.9	90.9	61	9.6	10.6	8.78	6	8.78	90.9	35.8	44.8
Strontium (Sr)	mg/L		---	0.09	0.0982	---	0.0564	0.0667	0.0538	5	0.0538	0.0982	0.0667	0.0730
Thallium (Tl)	mg/L		---	<0.000050	<0.000050	<0.00010	<0.000050	<0.20	<0.000050	6	0.00005	0.2	0.00005	0.03338
Tin (Sn)	mg/L		---	0.00036	0.00038	<0.050	<0.00020	<0.00020	<0.030	6	0.0002	0.05	0.0004	0.01
Titanium (Ti)	mg/L		---	0.00309	0.00304	0.0013	0.00033	<0.010	<0.00030	6	0.0003	0.004	0.002	0.003
Uranium (U)	mg/L	0.027	---	0.00273	0.00271	0.00463	0.00215	0.0021	0.00145	6	0.0015	0.0046	0.0024	0.0026
Vanadium (V)	mg/L		---	0.00275	0.00278	<0.0010	0.00012	0.00015	0.00012	6	0.00012	0.00278	0.000575	0.0012
Zinc (Zn)	mg/L	0.11	---	0.0021	0.0023	0.0064	0.0016	<0.0050	0.0019	6	0.0016	0.0064	0.0022	0.0032
DISSOLVED METALS (ICP-OES)														
Aluminum (Al)	mg/L	0.16	---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Antimony (Sb)	mg/L	0.03	---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Arsenic (As)	mg/L	0.05	---	0.33	0.36	---	---	---	---	2	0.33	0.36	0.345	0.3
Barium (Ba)	mg/L		---	0.0153	0.018	---	---	---	---	2	0.0153	0.018	0.01665	0.017
Beryllium (Be)	mg/L		---	<0.0050	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.01
Bismuth (Bi)	mg/L		---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Boron (B)	mg/L		---	0.112	0.13	---	---	---	---	2	0.112	0.13	0.121	0.1
Cadmium (Cd)	mg/L	0.00015	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Calcium (Ca)	mg/L		---	13.3	13.9	---	---	---	---	2	13.3	13.9	13.6	13.6
Chromium (Cr)	mg/L		---	<0.0050	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Cobalt (Co)	mg/L	0.004	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Copper (Cu)	mg/L	0.022	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Iron (Fe)	mg/L		---	0.259	0.307	---	---	---	---	2	0.259	0.307	0.283	0.3
Lead (Pb)	mg/L	0.001	---	<0.050	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Lithium (Li)	mg/L		---	0.0159	0.016	---	---	---	---	2	0.0159	0.016	0.01595	0.02
Magnesium (Mg)	mg/L		---	0.91	1	---	---	---	---	2	0.91	1	0.955	1.0
Manganese (Mn)	mg/L		---	0.00371	0.00375	---	---	---	---	2	0.00371	0.00375	0.00373	0.004
Molybdenum (Mo)	mg/L	0.073	---	0.0373	0.038	---	---	---	---	2	0.0373	0.038	0.03765	0.04
Nickel (Ni)	mg/L		---	<0.050	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Potassium (K)	mg/L		---	8.7	9.21	---	---	---	---	2	8.7	9.21	8.955	8.96
Selenium (Se)	mg/L	0.0035	---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.20
Silicon (Si)	mg/L		---	4.41	4.82	---	---	---	---	2	4.41	4.82	4.615	4.62
Silver (Ag)	mg/L		---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Sodium (Na)	mg/L		---	87.9	90.9	---	---	---	---	2	87.9	90.9	89.4	89
Strontium (Sr)	mg/L		---	0.109	0.0996	---	---	---	---	2	0.0996	0.109	0.1043	0.104
Sulfur (S)	mg/L		---	34.6	37.4	---	---	---	---	2	34.6	37.4	36	36.0
Thallium (Tl)	mg/L		---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2

Attachment 7.III.II-3
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	03-281	03-281	03-281	03-281	03-281	03-281	03-281	Number of Samples	Minimum - 03-281	Maximum - 03-281	Median - 03-281	Average - 03-281
Date			10-Jul-04	30-Aug-09	30-Aug-09	6-Apr-10	14-Jun-10	20-Jul-10	17-Aug-10	7				
Tin (Sn)	mg/L		---	<0.030	<0.030	---	---	---	---	2	0.03	0.03	0.03	0.03
Titanium (Ti)	mg/L	0.027	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Vanadium (V)	mg/L		---	<0.0050	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Zinc (Zn)	mg/L	0.11	---	<0.0050	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.01
TOTAL METALS (ICP-MS)														
Aluminum (Al)	mg/L	0.16	0.0	1.9	1.8	0.1	0.029	0.022	<0.20	7	0.0	1.9	0.1	0.6
Antimony (Sb)	mg/L	0.03	0.0060	0.0098	0.0094	0.0026	0.0044	<0.20	<0.20	7	0.003	0.2	0.009	0.06
Arsenic (As)	mg/L	0.05	0.40	0.80	0.77	0.39	0.69	0.65	0.73	7	0.39	0.80	0.69	0.63
Barium (Ba)	mg/L		0.0334	0.088	0.088	0.0301	0.0267	0.012	0.00877	7	0.00877	0.088	0.0301	0.041
Beryllium (Be)	mg/L		<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	7	0.0005	0.005	0.001	0.0015
Bismuth (Bi)	mg/L		0.00045	0.0189	0.0181	---	0.00066	<0.20	<0.00020	6	0.0002	0.2	0.009	0.04
Boron (B)	mg/L		0.037	0.13	0.13	0.099	0.044	0.0232	0.0219	7	0.0219	0.13	0.044	0.07
Cadmium (Cd)	mg/L	0.00015	<0.0001	0.0011	0.0011	0.00001	<0.00020	<0.00050	<0.010	7	0.0000	0.0100	0.0002	0.0018
Calcium (Ca)	mg/L		19.1	41.2	41.1	9.52	14.6	16.7	16.7	7	9.52	41.2	16.7	22.7
Cesium	mg/L		<0.0001	---	---	---	---	---	---	1	---	---	---	0.0001
Chromium (Cr)	mg/L		0.0027	0.0245	0.0245	<0.0010	<0.00080	<0.0050	<0.0050	7	0.0008	0.0245	0.005	0.009
Cobalt (Co)	mg/L	0.004	0.0077	0.00801	0.00778	<0.0020	0.00281	0.00363	0.00329	7	0.0020	0.0080	0.0036	0.005
Copper (Cu)	mg/L	0.022	0.007	0.023	0.024	0.002	0.007	<0.010	0.006	7	0.002	0.024	0.007	0.011
Iron (Fe)	mg/L		0.852	---	---	0.178	0.634	0.301	0.163	5	0.163	0.852	0.301	0.43
Lead (Pb)	mg/L	0.001	0.000	0.004	0.004	<0.00010	<0.00010	<0.050	<0.00010	7	0.000	0.050	0.000	0.008
Lithium (Li)	mg/L		0.0014	0.0149	0.0142	<0.010	---	<0.0060	<0.0060	6	0.0014	0.0149	0.008	0.009
Magnesium (Mg)	mg/L		13.6	2.31	2.25	4.04	9.38	12.4	13.1	7	2.25	13.6	9.38	8.2
Manganese (Mn)	mg/L		0.065	0.129	0.125	0.0076	0.0134	0.0185	0.0179	7	0.0076	0.129	0.0185	0.054
Molybdenum (Mo)	mg/L	0.073	0.0057	0.0394	0.0374	<0.0050	0.00386	<0.030	<0.030	7	0.004	0.039	0.030	0.022
Nickel (Ni)	mg/L		0.0015	0.0103	0.00992	<0.0020	0.00073	<0.050	0.00088	7	0.00073	0.05	0.002	0.01
Potassium (K)	mg/L		4.9	8.84	9.13	2.91	4.21	4.35	4.35	7	2.91	9.13	4.35	5.4
Rubidium	mg/L		<0.05	---	---	---	---	---	---	1	0.05	0.05	0.05	0.1
Selenium (Se)	mg/L	0.0035	0.0004	0.0005	0.0005	<0.00040	<0.00040	<0.20	0.00049	7	0.0004	0.2	0.00049	0.03
Silver (Ag)	mg/L		<0.0002	0.00073	0.00122	<0.00010	<0.00040	<0.00010	<0.00010	7	0.0001	0.00122	0.0002	0.0004
Sodium (Na)	mg/L		12	87.7	87.2	62.4	22.6	9.56	9	7	9	87.7	22.6	41.5
Strontium (Sr)	mg/L		0.0894	0.128	0.129	---	0.0952	0.0607	0.0538	7	0.0538	0.129	0.0923	0.093
Thallium (Tl)	mg/L		<0.00005	<0.00010	<0.00010	<0.00010	<0.00010	<0.20	<0.00010	7	0.00005	0.2	0.0001	0.03
Tin (Sn)	mg/L		0.0002	0.00204	0.00202	<0.050	<0.00040	<0.030	<0.030	7	0.0002	0.05	0.00204	0.02
Titanium (Ti)	mg/L		0.0006	0.0846	0.0821	0.0017	<0.0050	0.00075	<0.010	7	0.0006	0.0846	0.005	0.026
Uranium (U)	mg/L	0.027	0.0018	0.00365	0.00365	0.00514	0.00269	0.00201	0.00155	7	0.0016	0.0051	0.0027	0.00
Vanadium (V)	mg/L		0.0002	0.00753	0.00765	<0.0010	<0.00050	<0.00050	<0.00050	7	0.0002	0.00765	0.0005	0.003
Zinc (Zn)	mg/L	0.11	0.166	0.0552	0.0537	0.0062	<0.004	<0.005	<0.004	7	0.004	0.055	0.006	0.021
TOTAL METALS (ICP-OES)														
Aluminum (Al)	mg/L	0.16	---	1.88	1.89	---	---	---	---	2	1.88	1.89	1.885	1.9
Antimony (Sb)	mg/L	0.03	---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Arsenic (As)	mg/L	0.05	---	0.86	0.85	---	---	---	---	2	0.85	0.86	0.855	0.9
Barium (Ba)	mg/L		---	0.0971	0.0976	---	---	---	---	2	0.0971	0.0976	0.0974	0.0974
Beryllium (Be)	mg/L		---	<0.0050	<0.0050	---	---	---	---	2	0.005	0.005	0.005	0.005
Bismuth (Bi)	mg/L		---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Boron (B)	mg/L		---	<0.10	<0.10	---	---	---	---	2	0.1	0.1	0.1	0.1
Cadmium (Cd)	mg/L	0.00015	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Calcium (Ca)	mg/L		---	42.4	43.1	---	---	---	---	2	42.4	43.1	42.8	42.8
Chromium (Cr)	mg/L		---	0.026	0.0261	---	---	---	---	2	0.026	0.0261	0.03	0.03
Cobalt (Co)	mg/L	0.004	---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Copper (Cu)	mg/L	0.022	---	0.028	0.029	---	---	---	---	2	0.028	0.029	0.0285	0.03
Iron (Fe)	mg/L		---	18.4	18	---	---	---	---	2	18	18.4	18.2	18
Lead (Pb)	mg/L	0.001	---	<0.050	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Lithium (Li)	mg/L		---	0.016	0.016	---	---	---	---	2	0.016	0.016	0.016	0.016
Magnesium (Mg)	mg/L		---	2.43	2.47	---	---	---	---	2	2.43	2.47	2.45	2.45
Manganese (Mn)	mg/L		---	0.132	0.131	---	---	---	---	2	0.131	0.132	0.13	0.13
Molybdenum (Mo)	mg/L	0.073	---	0.048	0.047	---	---	---	---	2	0.047	0.048	0.048	0.048
Nickel (Ni)	mg/L		---	<0.050	<0.050	---	---	---	---	2	0.05	0.05	0.05	0.05
Potassium (K)	mg/L		---	9.18	9.17	---	---	---	---	2	9.17	9.18	9.18	9.18
Selenium (Se)	mg/L	0.0035	---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Silicon (Si)	mg/L		---	12.1	12.3	---	---	---	---	2	12.1	12.3	12.2	12.2
Silver (Ag)	mg/L		---	<0.010	<0.010	---	---	---	---	2	0.01	0.01	0.01	0.01
Sodium (Na)	mg/L		---	---	---	---	---	---	---	0	---	---	---	---
Strontium (Sr)	mg/L		---	0.137	0.136	---	---	---	---	2	0.136	0.137	0.137	0.137
Sulfur (S)	mg/L		---	40.7	41.6	---	---	---	---	2	40.7	41.6	41.15	41.2
Thallium (Tl)	mg/L		---	<0.20	<0.20	---	---	---	---	2	0.2	0.2	0.2	0.2
Tin (Sn)	mg/L		---	<0.030	<0.030	---	---	---	---	2	0.03	0.03	0.03	0.03
Titanium (Ti)	mg/L		---	0.086	0.085	---	---	---	---	2	0.085	0.086	0.086	0.09
Vanadium (V)	mg/L		---	0.008	0.0078	---	---	---	---	2	0.0078	0.008	0.0079	0.008
Zinc (Zn)	mg/L	0.11	---	0.0589	0.0586	---	---	---	---	2	0.0586	0.0589	0.05875	0.06

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	10-291-86	10-291-116	10-291-160
Date			17-Aug-10	17-Aug-10	17-Aug-10
GENERAL PARAMETERS					
pH	pH units		8.31	8.28	8.17
Conductivity	µS/cm		317	316	306
Alkalinity	mg/L as CaCO ₃		102	102	99.6
Hardness ²	mg/L as CaCO ₃		78.7	89.4	84.4
Bicarbonate (HCO ₃)	mg/L		117	124	122
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	< 5.0
Total Dissolved Solids (TDS)	mg/L		192	193	191
ANIONS & NUTRIENTS					
Chloride (Cl)	mg/L	353	7.98	8.04	7.93
Sulphate (SO ₄)	mg/L	500	55	54.7	52.6
Fluoride (F)	mg/L		1.62	1.39	1.2
Phosphorous (P)	mg/L		< 0.020	< 0.020	< 0.020
Ammonia (NH ₃)	as N mg/L	0.5	0.191	0.209	0.207
Nitrite (NO ₂)	as N mg/L		< 0.050	< 0.050	< 0.050
Nitrate (NO ₃)	as N mg/L		0.142	0.132	0.148
DISSOLVED METALS (ICP-MS)					
Aluminum (Al)	mg/L	0.16	0.506	0.498	0.612
Antimony (Sb)	mg/L	0.03	< 0.20	< 0.20	0.0040
Arsenic (As)	mg/L	0.05	0.052	0.085	0.039
Barium (Ba)	mg/L		0.02	0.0247	0.023
Beryllium (Be)	mg/L		< 0.0050	< 0.0050	< 0.00050
Bismuth (Bi)	mg/L		0.00636	< 0.20	0.00949
Boron (B)	mg/L		0.112	< 0.10	0.0531
Cadmium (Cd)	mg/L	0.00015	0.0001	0.0001	< 0.010
Calcium (Ca)	mg/L		22.1	23.6	22.7
Cesium (Cs)	mg/L		---	---	---
Chromium (Cr)	mg/L		< 0.0050	< 0.0050	0.0018
Cobalt (Co)	mg/L	0.004	0.0003	< 0.010	0.0003
Copper (Cu)	mg/L	0.022	< 0.010	0.03220	< 0.010
Iron (Fe)	mg/L		1.78	1.76	2.41
Lead (Pb)	mg/L	0.001	< 0.05	< 0.05	< 0.05
Lithium (Li)	mg/L		0.0121	0.011	0.0114
Magnesium (Mg)	mg/L		7.73	7.79	7.53
Manganese (Mn)	mg/L		0.0361	0.0349	0.0323
Molybdenum (Mo)	mg/L	0.073	0.069	0.073	0.080
Nickel (Ni)	mg/L		< 0.050	< 0.050	0.00172
Phosphorous (P)	mg/L		< 0.01	< 0.1	< 0.1
Potassium (K)	mg/L		10.4	11.7	10.8
Selenium (Se)	mg/L	0.0035	< 0.00040	< 0.00040	< 0.00040
Silver (Ag)	mg/L		< 0.010	< 0.00010	< 0.00010
Sodium (Na)	mg/L		24.4	22.2	21.4
Strontium (Sr)	mg/L		0.133	0.125	0.123
Thallium (Tl)	mg/L		< 0.20	< 0.20	< 0.20
Tin (Sn)	mg/L		< 0.030	< 0.030	< 0.030
Titanium (Ti)	mg/L		0.0426	0.0428	0.0537
Uranium (U)	mg/L	0.027	0.00154	0.00165	0.00154
Vanadium (V)	mg/L		< 0.0050	< 0.0050	0.00127
Zinc (Zn)	mg/L	0.11	0.0085	0.0115	0.0076
TOTAL METALS (ICP-MS)					
Aluminum (Al)	mg/L	0.16	2.0	2.0	2.1
Antimony (Sb)	mg/L	0.03	0.00528	0.00717	0.00385
Arsenic (As)	mg/L	0.05	0.07	0.06	0.05
Barium (Ba)	mg/L		0.034	0.038	0.039
Beryllium (Be)	mg/L		< 0.0010	< 0.0050	< 0.0010
Bismuth (Bi)	mg/L		0.0182	0.0163	< 0.20
Boron (B)	mg/L		0.13	0.12	< 0.10
Cadmium (Cd)	mg/L	0.00015	0.0001	0.0001	< 0.010
Calcium (Ca)	mg/L		21.5	22.5	22.9
Cesium	mg/L		---	---	---
Chromium (Cr)	mg/L		< 0.0050	0.00319	< 0.0050
Cobalt (Co)	mg/L	0.004	0.00076	0.00069	< 0.010
Copper (Cu)	mg/L	0.022	< 0.010	< 0.010	0.0081
Iron (Fe)	mg/L		5.41	5.63	6.08
Lead (Pb)	mg/L	0.001	0.001	0.001	0.002
Lithium (Li)	mg/L		0.0123	0.0118	0.0114
Magnesium (Mg)	mg/L		7.55	8.33	8.64
Manganese (Mn)	mg/L		0.0532	0.0475	0.0477
Molybdenum (Mo)	mg/L	0.073	0.062	0.105	0.068
Nickel (Ni)	mg/L		< 0.050	< 0.050	0.00343
Potassium (K)	mg/L		10.9	12.7	11.1
Rubidium	mg/L		---	---	---
Selenium (Se)	mg/L	0.0035	< 0.00040	< 0.00040	< 0.00040
Silver (Ag)	mg/L		0.00017	< 0.010	0.00018
Sodium (Na)	mg/L		25.1	22.5	22.9
Strontium (Sr)	mg/L		0.128	0.133	0.132
Thallium (Tl)	mg/L		< 0.20	< 0.20	< 0.00010
Tin (Sn)	mg/L		0.00074	< 0.030	< 0.030
Titanium (Ti)	mg/L		0.127	0.11	0.136
Uranium (U)	mg/L	0.027	0.00142	0.00171	0.00155
Vanadium (V)	mg/L		< 0.0050	0.00236	< 0.0050
Zinc (Zn)	mg/L	0.11	0.0213	0.0424	0.034

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	97-051	97-051
Date			16-Aug-10	21-Feb-11
GENERAL PARAMETERS				
pH	pH units		8.36	8.42
Conductivity	µS/cm		349	354
Alkalinity	mg/L as CaCO ₃		134	140
Hardness ²	mg/L as CaCO ₃		127	109
Bicarbonate (HCO ₃)	mg/L		150	165
Carbonate (CO ₃)	mg/L		6.5	<5.0
Total Dissolved Solids (TDS)	mg/L		212	
ANIONS & NUTRIENTS				
Chloride (Cl)	mg/L	353	5.04	0.5
Sulphate (SO ₄)	mg/L	500	50.3	48.7
Fluoride (F)	mg/L		0.748	0.97
Phosphorous (P)	mg/L		0.271	0.152
Ammonia (NH ₃)	as N mg/L	0.5	< 0.050	<0.050
Nitrite (NO ₂)	as N mg/L		< 0.050	<0.050
Nitrate (NO ₃)	as N mg/L		0.144	<0.050
DISSOLVED METALS (ICP-MS)				
Aluminum (Al)	mg/L	0.16	< 0.20	<0.20
Antimony (Sb)	mg/L	0.03	0.0087	<0.20
Arsenic (As)	mg/L	0.05	0.416	<0.20
Barium (Ba)	mg/L		0.029	0.016
Beryllium (Be)	mg/L		< 0.00050	<0.0050
Bismuth (Bi)	mg/L		< 0.20	<0.20
Boron (B)	mg/L		0.029	<0.10
Cadmium (Cd)	mg/L	0.00015	< 0.010	<0.010
Calcium (Ca)	mg/L		40.5	28.1
Cesium (Cs)	mg/L		---	
Chromium (Cr)	mg/L		< 0.0050	<0.0050
Cobalt (Co)	mg/L	0.004	< 0.010	<0.010
Copper (Cu)	mg/L	0.022	< 0.010	<0.010
Iron (Fe)	mg/L		< 0.010	0.013
Lead (Pb)	mg/L	0.001	< 0.0001	<0.050
Lithium (Li)	mg/L		< 0.01	<0.010
Magnesium (Mg)	mg/L		10.5	9.33
Manganese (Mn)	mg/L		0.0166	0.0179
Molybdenum (Mo)	mg/L	0.073	0.033	<0.030
Nickel (Ni)	mg/L		0.00074	<0.050
Phosphorous (P)	mg/L		< 0.01	<0.10
Potassium (K)	mg/L		2.79	1.87
Selenium (Se)	mg/L	0.0035	< 0.00040	<0.20
Silver (Ag)	mg/L		< 0.010	<0.010
Sodium (Na)	mg/L		19.7	32.3
Strontium (Sr)	mg/L		0.306	0.333
Thallium (Tl)	mg/L		< 0.000050	<0.20
Tin (Sn)	mg/L		< 0.030	<0.030
Titanium (Ti)	mg/L		< 0.010	<0.010
Uranium (U)	mg/L	0.027	0.0257	0.0145
Vanadium (V)	mg/L		0.00021	<0.0050
Zinc (Zn)	mg/L	0.11	< 0.0050	<0.0050
TOTAL METALS (ICP-MS)				
Aluminum (Al)	mg/L	0.16	26.9	1.6
Antimony (Sb)	mg/L	0.03	< 0.20	<0.20
Arsenic (As)	mg/L	0.05	5.64	0.48
Barium (Ba)	mg/L		0.283	0.034
Beryllium (Be)	mg/L		0.0137	<0.0050
Bismuth (Bi)	mg/L		0.156	<0.20
Boron (B)	mg/L		< 0.10	<0.10
Cadmium (Cd)	mg/L	0.00015	< 0.010	<0.010
Calcium (Ca)	mg/L		47.3	29.3
Cesium	mg/L		---	<0.0050
Chromium (Cr)	mg/L		0.0188	0.011
Cobalt (Co)	mg/L	0.004	0.238	0.054
Copper (Cu)	mg/L	0.022	0.635	4.85
Iron (Fe)	mg/L		83.3	<0.050
Lead (Pb)	mg/L	0.001	< 0.050	0.011
Lithium (Li)	mg/L		0.025	10.9
Magnesium (Mg)	mg/L		37.7	0.0399
Manganese (Mn)	mg/L		0.376	<0.00010
Molybdenum (Mo)	mg/L	0.073	0.036	<0.030
Nickel (Ni)	mg/L		0.0123	<0.050
Potassium (K)	mg/L		12.4	<0.10
Rubidium	mg/L		---	2.74
Selenium (Se)	mg/L	0.0035	< 0.00040	<0.20
Silver (Ag)	mg/L		0.0156	<0.010
Sodium (Na)	mg/L		18.2	34.2
Strontium (Sr)	mg/L		0.349	0.346
Thallium (Tl)	mg/L		< 0.20	<0.20
Tin (Sn)	mg/L		0.00483	<0.030
Titanium (Ti)	mg/L		1.39	0.083
Uranium (U)	mg/L	0.027	0.0309	0.0155
Vanadium (V)	mg/L		0.0201	<0.0050
Zinc (Zn)	mg/L	0.11	0.0482	0.0286

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	MC-04-01	MC-04-01	Number of Samples	Minimum - MC-04-01	Maximum - MC-04-01	Median - MC-04-01	Average - MC-04-01
Date			29-Aug-09	16-Aug-10	2				
GENERAL PARAMETERS									
pH	pH units		7.34	6.53	2	6.5	7.3	6.9	6.9
Conductivity	µS/cm		144	87	2	87	144	115.5	116
Alkalinity	mg/L as CaCO ₃		60.4	35.6	2	35.6	60.4	48	48
Hardness ²	mg/L as CaCO ₃		105	66.3	2	66.3	105	85.65	86
Bicarbonate (HCO ₃)	mg/L		73.7	43.5	2	43.5	73.7	58.6	59
Carbonate (CO ₃)	mg/L		<5.0	<5.0	2	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		114	71.3	2	71.3	114	92.65	93
ANIONS & NUTRIENTS									
Chloride (Cl)	mg/L	353	<0.50	5.88	2	0.50	5.88	3.19	3.19
Sulphate (SO ₄)	mg/L	500	9.75	10.3	2	9.8	10.3	10.0	10.0
Fluoride (F)	mg/L		0.428	0.563	2	0.428	0.563	0.4955	0.496
Phosphorous (P)	mg/L		0.512	0.275	2	0.275	0.512	0.3935	0.39
Ammonia (NH ₃)	as N mg/L	0.5	0.313	<0.050	2	0.05	0.31	0.18	0.18
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	2	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		0.471	0.965	2	0.471	0.965	0.718	0.72
DISSOLVED METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	0.062	0.490	2	0.062	0.490	0.276	0.276
Antimony (Sb)	mg/L	0.03	<0.00040	<0.20	2	0.0004	0.2000	0.1	0.1
Arsenic (As)	mg/L	0.05	0.00041	<0.00040	2	0.000	0.000	0.0004	0.0004
Barium (Ba)	mg/L		0.0195	0.0199	2	0.0195	0.0199	0.0197	0.0197
Beryllium (Be)	mg/L		<0.00050	<0.00050	2	0.0005	0.0005	0.0005	0.0005
Bismuth (Bi)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Boron (B)	mg/L		0.0098	0.0079	2	0.0079	0.0098	0.009	0.009
Cadmium (Cd)	mg/L	0.00015	<0.000050	<0.010	2	0.00005	0.0100	0.005	0.005
Calcium (Ca)	mg/L		29.2	16.3	2	16.3	29.2	22.75	22.8
Cesium (Cs)	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		<0.00040	<0.0050	2	0.0004	0.005	0.0027	0.0027
Cobalt (Co)	mg/L	0.004	0.0005	0.0100	2	0.0005	0.0100	0.0053	0.0053
Copper (Cu)	mg/L	0.022	0.00333	0.00857	2	0.00333	0.00857	0.00595	0.00595
Iron (Fe)	mg/L		---	0.174	1	---	---	---	0.17
Lead (Pb)	mg/L	0.001	<0.00010	0.00015	2	0.00	0.00	0.00	0.00
Lithium (Li)	mg/L		<0.0030	<0.010	2	0.003	0.01	0.007	0.007
Magnesium (Mg)	mg/L		6.4	4.53	2	4.53	6.4	5.5	5.5
Manganese (Mn)	mg/L		0.0644	0.0711	2	0.0644	0.0711	0.0678	0.0678
Molybdenum (Mo)	mg/L	0.073	0.00329	<0.030	2	0.0033	0.030	0.02	0.02
Nickel (Ni)	mg/L		0.00092	<0.050	2	0.00092	0.05	0.03	0.03
Phosphorous (P)	mg/L		---	0.2	1	---	---	---	0.2
Potassium (K)	mg/L		1.14	1.55	2	1.14	1.55	1.35	1.35
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00010	<0.010	2	0.0001	0.01	0.01	0.01
Sodium (Na)	mg/L		1.84	3.7	2	1.84	3.7	2.8	2.8
Strontium (Sr)	mg/L		0.0596	0.0635	2	0.0596	0.0635	0.0616	0.0616
Thallium (Tl)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Tin (Sn)	mg/L		<0.00020	<0.030	2	0.0002	0.03	0.02	0.02
Titanium (Ti)	mg/L		0.00128	<0.010	2	0.00128	0.01	0.01	0.01
Uranium (U)	mg/L	0.027	0.00882	0.00568	2	0.0057	0.0088	0.00725	0.00725
Vanadium (V)	mg/L		0.00016	<0.0050	2	0.00016	0.005	0.003	0.003
Zinc (Zn)	mg/L	0.11	0.003	0.0152	2	0.0030	0.0152	0.009	0.009
TOTAL METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	12.8	17.3	2	12.8	17.3	15.1	15.1
Antimony (Sb)	mg/L	0.03	0.00104	<0.00040	2	0.000	0.0	0.001	0.001
Arsenic (As)	mg/L	0.05	0.00763	0.00538	2	0.01	0.01	0.01	0.01
Barium (Ba)	mg/L		0.145	0.107	2	0.107	0.145	0.126	0.126
Beryllium (Be)	mg/L		<0.0010	<0.0050	2	0.001	0.005	0.003	0.003
Bismuth (Bi)	mg/L		0.00317	0.00066	2	0.00066	0.00317	0.00192	0.00192
Boron (B)	mg/L		<0.020	<0.10	2	0.02	0.1	0.1	0.1
Cadmium (Cd)	mg/L	0.00015	0.0018	<0.010	2	0.0018	0.0100	0.01	0.01
Calcium (Ca)	mg/L		40	24.8	2	24.8	40	32	32
Cesium	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.0211	0.00704	2	0.00704	0.0211	0.014	0.014
Cobalt (Co)	mg/L	0.004	0.00848	<0.010	2	0.0085	0.0100	0.01	0.01
Copper (Cu)	mg/L	0.022	0.127	0.082	2	0.082	0.127	0.10	0.10
Iron (Fe)	mg/L		28.6	11.8	2	11.8	28.6	20.2	20.2
Lead (Pb)	mg/L	0.001	0.013	<0.050	2	0.013	0.050	0.031	0.031
Lithium (Li)	mg/L		---	<0.010	1	---	---	---	0.01
Magnesium (Mg)	mg/L		14.8	8.85	2	8.85	14.8	11.8	11.8
Manganese (Mn)	mg/L		0.395	0.19	2	0.19	0.395	0.29	0.29
Molybdenum (Mo)	mg/L	0.073	0.00398	<0.030	2	0.004	0.030	0.02	0.02
Nickel (Ni)	mg/L		0.0153	<0.050	2	0.0153	0.05	0.03	0.03
Potassium (K)	mg/L		8.24	3.93	2	3.93	8.24	6.1	6.1
Rubidium	mg/L		---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	0.0018	<0.00040	2	0.0004	0.0018	0.0011	0.0011
Silver (Ag)	mg/L		0.035	<0.010	2	0.01	0.035	0.02	0.02
Sodium (Na)	mg/L		4.4	3.46	2	3.46	4.4	3.93	3.9
Strontium (Sr)	mg/L		0.0893	0.0849	2	0.0849	0.0893	0.0871	0.087
Thallium (Tl)	mg/L		0.00021	<0.20	2	0.00021	0.2	0.1	0.1
Tin (Sn)	mg/L		0.0034	0.0006	2	0.0006	0.0034	0.002	0.002
Titanium (Ti)	mg/L		0.821	0.0728	2	0.0728	0.821	0.4469	0.447
Uranium (U)	mg/L	0.027	0.0174	0.0151	2	0.0151	0.0174	0.0163	0.02
Vanadium (V)	mg/L		0.023	0.0093	2	0.0093	0.023	0.01615	0.016
Zinc (Zn)	mg/L	0.11	0.0788	0.073	2	0.073	0.079	0.076	0.076

Notes:
0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives

PARAMETER	UNITS	Site Specific Water Quality Objectives	MC-04-12
Date			28-Aug-09
GENERAL PARAMETERS			
pH	pH units		7.28
Conductivity	µS/cm		78.9
Alkalinity	mg/L as CaCO ₃		31.6
Hardness ²	mg/L as CaCO ₃		33.7
Bicarbonate (HCO ₃)	mg/L		38.6
Carbonate (CO ₃)	mg/L		< 5.0
Total Dissolved Solids (TDS)	mg/L		68
ANIONS & NUTRIENTS			
Chloride (Cl)	mg/L	353	<0.50
Sulphate (SO ₄)	mg/L	500	6.9
Fluoride (F)	mg/L		0.074
Phosphorous (P)	mg/L		0.03
Ammonia (NH ₃)	as N mg/L	0.5	<0.050
Nitrite (NO ₂)	as N mg/L		<0.050
Nitrate (NO ₃)	as N mg/L		<0.050
DISSOLVED METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	0.469
Antimony (Sb)	mg/L	0.03	<0.00040
Arsenic (As)	mg/L	0.05	0.00086
Barium (Ba)	mg/L		0.0194
Beryllium (Be)	mg/L		<0.00050
Bismuth (Bi)	mg/L		<0.000050
Boron (B)	mg/L		0.0036
Cadmium (Cd)	mg/L	0.00015	<0.000050
Calcium (Ca)	mg/L		10.2
Cesium (Cs)	mg/L		---
Chromium (Cr)	mg/L		0.00077
Cobalt (Co)	mg/L	0.004	0.00055
Copper (Cu)	mg/L	0.022	0.0123
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	0.0003
Lithium (Li)	mg/L		<0.0030
Magnesium (Mg)	mg/L		1.94
Manganese (Mn)	mg/L		0.0768
Molybdenum (Mo)	mg/L	0.073	0.00075
Nickel (Ni)	mg/L		0.00151
Phosphorous (P)	mg/L		---
Potassium (K)	mg/L		0.657
Selenium (Se)	mg/L	0.0035	<0.00040
Silver (Ag)	mg/L		<0.00010
Sodium (Na)	mg/L		2.13
Strontium (Sr)	mg/L		0.0437
Thallium (Tl)	mg/L		<0.000050
Tin (Sn)	mg/L		0.00025
Titanium (Ti)	mg/L		0.00178
Uranium (U)	mg/L	0.027	0.00174
Vanadium (V)	mg/L		0.00049
Zinc (Zn)	mg/L	0.11	0.0023
DISSOLVED METALS (ICP-OES)			
Aluminum (Al)	mg/L	0.16	---
Antimony (Sb)	mg/L	0.03	---
Arsenic (As)	mg/L	0.05	---
Barium (Ba)	mg/L		---
Beryllium (Be)	mg/L		---
Bismuth (Bi)	mg/L		---
Boron (B)	mg/L		---
Cadmium (Cd)	mg/L	0.00015	---
Calcium (Ca)	mg/L		---
Chromium (Cr)	mg/L		---
Cobalt (Co)	mg/L	0.004	---
Copper (Cu)	mg/L	0.022	---
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	---
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		---
Manganese (Mn)	mg/L		---
Molybdenum (Mo)	mg/L	0.073	---
Nickel (Ni)	mg/L		---
Potassium (K)	mg/L		---
Selenium (Se)	mg/L	0.0035	---
Silicon (Si)	mg/L		---
Silver (Ag)	mg/L		---
Sodium (Na)	mg/L		---
Strontium (Sr)	mg/L		---
Sulfur (S)	mg/L		---
Thallium (Tl)	mg/L		---
Tin (Sn)	mg/L		---
Titanium (Ti)	mg/L	0.027	---
Vanadium (V)	mg/L		---
Zinc (Zn)	mg/L	0.11	---

PARAMETER	UNITS	Site Specific Water Quality Objectives	MC-04-12
Date			28-Aug-09
TOTAL METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	1.91
Antimony (Sb)	mg/L	0.03	<0.00040
Arsenic (As)	mg/L	0.05	0.00161
Barium (Ba)	mg/L		0.0442
Beryllium (Be)	mg/L		<0.0010
Bismuth (Bi)	mg/L		<0.00020
Boron (B)	mg/L		<0.020
Cadmium (Cd)	mg/L	0.00015	<0.00020
Calcium (Ca)	mg/L		12.1
Cesium	mg/L		---
Chromium (Cr)	mg/L		0.00294
Cobalt (Co)	mg/L	0.004	0.00081
Copper (Cu)	mg/L	0.022	0.0325
Iron (Fe)	mg/L		2.89
Lead (Pb)	mg/L	0.001	0.00139
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		2.87
Manganese (Mn)	mg/L		0.0897
Molybdenum (Mo)	mg/L	0.073	0.00066
Nickel (Ni)	mg/L		0.00336
Potassium (K)	mg/L		2.2
Rubidium	mg/L		---
Selenium (Se)	mg/L	0.0035	<0.00040
Silver (Ag)	mg/L		0.014
Sodium (Na)	mg/L		2.4
Strontium (Sr)	mg/L		0.0431
Thallium (Tl)	mg/L		<0.00010
Tin (Sn)	mg/L		0.0008
Titanium (Ti)	mg/L		0.0488
Uranium (U)	mg/L	0.027	0.00185
Vanadium (V)	mg/L		0.00225
Zinc (Zn)	mg/L	0.11	0.0075
TOTAL METALS (ICP-OES)			
Aluminum (Al)	mg/L	0.16	---
Antimony (Sb)	mg/L	0.03	---
Arsenic (As)	mg/L	0.05	---
Barium (Ba)	mg/L		---
Beryllium (Be)	mg/L		---
Bismuth (Bi)	mg/L		---
Boron (B)	mg/L		---
Cadmium (Cd)	mg/L	0.00015	---
Calcium (Ca)	mg/L		---
Chromium (Cr)	mg/L		---
Cobalt (Co)	mg/L	0.004	---
Copper (Cu)	mg/L	0.022	---
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	---
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		---
Manganese (Mn)	mg/L		---
Molybdenum (Mo)	mg/L	0.073	---
Nickel (Ni)	mg/L		---
Potassium (K)	mg/L		---
Selenium (Se)	mg/L	0.0035	---
Silicon (Si)	mg/L		---
Silver (Ag)	mg/L		---
Sodium (Na)	mg/L		---
Strontium (Sr)	mg/L		---
Sulfur (S)	mg/L		---
Thallium (Tl)	mg/L		---
Tin (Sn)	mg/L		---
Titanium (Ti)	mg/L		---
Vanadium (V)	mg/L		---
Zinc (Zn)	mg/L	0.11	---

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	EBA-04-06
Date			28-Aug-09
GENERAL PARAMETERS			
pH	pH units		7.96
Conductivity	µS/cm		253
Alkalinity	mg/L as CaCO ₃		124
Hardness ²	mg/L as CaCO ₃		131
Bicarbonate (HCO ₃)	mg/L		152
Carbonate (CO ₃)	mg/L		< 5.0
Total Dissolved Solids (TDS)	mg/L		164
ANIONS & NUTRIENTS			
Chloride (Cl)	mg/L	353	<0.50
Sulphate (SO ₄)	mg/L	500	8.12
Fluoride (F)	mg/L		0.09
Phosphorous (P)	mg/L		1.4
Ammonia (NH ₃)	as N mg/L	0.5	0.104
Nitrite (NO ₂)	as N mg/L		<0.050
Nitrate (NO ₃)	as N mg/L		<0.050
DISSOLVED METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	0.0115
Antimony (Sb)	mg/L	0.03	<0.00040
Arsenic (As)	mg/L	0.05	0.00454
Barium (Ba)	mg/L		0.00816
Beryllium (Be)	mg/L		<0.00050
Bismuth (Bi)	mg/L		<0.000050
Boron (B)	mg/L		0.02
Cadmium (Cd)	mg/L	0.00015	<0.000050
Calcium (Ca)	mg/L		39.6
Cesium (Cs)	mg/L		---
Chromium (Cr)	mg/L		<0.00040
Cobalt (Co)	mg/L	0.004	0.00011
Copper (Cu)	mg/L	0.022	0.00164
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	<0.00010
Lithium (Li)	mg/L		0.0033
Magnesium (Mg)	mg/L		6.36
Manganese (Mn)	mg/L		0.0908
Molybdenum (Mo)	mg/L	0.073	0.00138
Nickel (Ni)	mg/L		0.00135
Phosphorous (P)	mg/L		---
Potassium (K)	mg/L		1.57
Selenium (Se)	mg/L	0.0035	<0.00040
Silver (Ag)	mg/L		<0.00010
Sodium (Na)	mg/L		3.31
Strontium (Sr)	mg/L		0.17
Thallium (Tl)	mg/L		<0.000050
Tin (Sn)	mg/L		<0.00020
Titanium (Ti)	mg/L		0.0008
Uranium (U)	mg/L	0.027	0.00457
Vanadium (V)	mg/L		0.00024
Zinc (Zn)	mg/L	0.11	0.0031
DISSOLVED METALS (ICP-OES)			
Aluminum (Al)	mg/L	0.16	---
Antimony (Sb)	mg/L	0.03	---
Arsenic (As)	mg/L	0.05	---
Barium (Ba)	mg/L		---
Beryllium (Be)	mg/L		---
Bismuth (Bi)	mg/L		---
Boron (B)	mg/L		---
Cadmium (Cd)	mg/L	0.00015	---
Calcium (Ca)	mg/L		---
Chromium (Cr)	mg/L		---
Cobalt (Co)	mg/L	0.004	---
Copper (Cu)	mg/L	0.022	---
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	---
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		---
Manganese (Mn)	mg/L		---
Molybdenum (Mo)	mg/L	0.073	---
Nickel (Ni)	mg/L		---
Potassium (K)	mg/L		---
Selenium (Se)	mg/L	0.0035	---
Silicon (Si)	mg/L		---
Silver (Ag)	mg/L		---
Sodium (Na)	mg/L		---
Strontium (Sr)	mg/L		---
Sulfur (S)	mg/L		---
Thallium (Tl)	mg/L		---
Tin (Sn)	mg/L		---
Titanium (Ti)	mg/L	0.027	---
Vanadium (V)	mg/L		---
Zinc (Zn)	mg/L	0.11	---

PARAMETER	UNITS	Site Specific Water Quality Objectives	EBA-04-06
Date			28-Aug-09
TOTAL METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	60.5
Antimony (Sb)	mg/L	0.03	0.0005
Arsenic (As)	mg/L	0.05	0.0959
Barium (Ba)	mg/L		0.207
Beryllium (Be)	mg/L		0.0037
Bismuth (Bi)	mg/L		0.0008
Boron (B)	mg/L		<0.020
Cadmium (Cd)	mg/L	0.00015	<0.00020
Calcium (Ca)	mg/L		59.8
Cesium	mg/L		---
Chromium (Cr)	mg/L		0.0911
Cobalt (Co)	mg/L	0.004	0.0197
Copper (Cu)	mg/L	0.022	0.613
Iron (Fe)	mg/L		144
Lead (Pb)	mg/L	0.001	0.0138
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		74.6
Manganese (Mn)	mg/L		2.22
Molybdenum (Mo)	mg/L	0.073	0.00183
Nickel (Ni)	mg/L		0.112
Potassium (K)	mg/L		8.96
Rubidium	mg/L		---
Selenium (Se)	mg/L	0.0035	0.00384
Silver (Ag)	mg/L		0.00896
Sodium (Na)	mg/L		5.7
Strontium (Sr)	mg/L		0.194
Thallium (Tl)	mg/L		0.00011
Tin (Sn)	mg/L		0.00233
Titanium (Ti)	mg/L		0.427
Uranium (U)	mg/L	0.027	0.0111
Vanadium (V)	mg/L		0.114
Zinc (Zn)	mg/L	0.11	0.364
TOTAL METALS (ICP-OES)			
Aluminum (Al)	mg/L	0.16	---
Antimony (Sb)	mg/L	0.03	---
Arsenic (As)	mg/L	0.05	---
Barium (Ba)	mg/L		---
Beryllium (Be)	mg/L		---
Bismuth (Bi)	mg/L		---
Boron (B)	mg/L		---
Cadmium (Cd)	mg/L	0.00015	---
Calcium (Ca)	mg/L		---
Chromium (Cr)	mg/L		---
Cobalt (Co)	mg/L	0.004	---
Copper (Cu)	mg/L	0.022	---
Iron (Fe)	mg/L		---
Lead (Pb)	mg/L	0.001	---
Lithium (Li)	mg/L		---
Magnesium (Mg)	mg/L		---
Manganese (Mn)	mg/L		---
Molybdenum (Mo)	mg/L	0.073	---
Nickel (Ni)	mg/L		---
Potassium (K)	mg/L		---
Selenium (Se)	mg/L	0.0035	---
Silicon (Si)	mg/L		---
Silver (Ag)	mg/L		---
Sodium (Na)	mg/L		---
Strontium (Sr)	mg/L		---
Sulfur (S)	mg/L		---
Thallium (Tl)	mg/L		---
Tin (Sn)	mg/L		---
Titanium (Ti)	mg/L		---
Vanadium (V)	mg/L		---
Zinc (Zn)	mg/L	0.11	---

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Attachment 7.III.II-9
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-21	GA-10-21	Number of Samples	Minimum - GA-10-21	Maximum - GA-10-21	Median - GA-10-21	Average - GA-10-21
Date			12-Jun-10	15-Aug-10	2				
GENERAL PARAMETERS									
pH	pH units		7.95	8.02	2	7.95	8.0	8.0	8.0
Conductivity	µS/cm		458	287	2	287	458	372.5	373
Alkalinity	mg/L as CaCO ₃		199	131	2	131	199	165	165
Hardness ²	mg/L as CaCO ₃		148	110	2	110	148	129	129
Bicarbonate (HCO ₃)	mg/L		243	160	2	160	243	201.5	202
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	2	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		258	170	2	170	258	214	214
ANIONS & NUTRIENTS									
Chloride (Cl)	mg/L	353	3.55	5.27	2	3.55	5.27	4.41	4.41
Sulphate (SO ₄)	mg/L	500	39.5	22.1	2	22	40	31	31
Fluoride (F)	mg/L		0.245	0.499	2	0.245	0.499	0.372	0.372
Phosphorous (P)	mg/L		0.313	0.155	2	0.155	0.313	0.234	0.23
Ammonia (NH ₃)	as N mg/L	0.5	0.313	0.108	2	0.108	0.313	0.211	0.211
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	2	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		<0.050	0.128	2	0.05	0.128	0.089	0.09
DISSOLVED METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	0.041	<0.20	2	0.041	0.200	0.2	0.2
Antimony (Sb)	mg/L	0.03	0.00248	<0.20	2	0.0025	0.2000	0.1	0.1
Arsenic (As)	mg/L	0.05	0.00485	0.00234	2	0.002	0.005	0.004	0.004
Barium (Ba)	mg/L		0.0309	0.0295	2	0.0295	0.0309	0.0302	0.0302
Beryllium (Be)	mg/L		<0.00050	<0.0050	2	0.0005	0.005	0.003	0.003
Bismuth (Bi)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Boron (B)	mg/L		0.0293	<0.10	2	0.0293	0.1	0.06	0.06
Cadmium (Cd)	mg/L	0.00015	<0.00010	<0.010	2	0.00010	0.0100	0.0051	0.0051
Calcium (Ca)	mg/L		44.6	37.5	2	37.5	44.6	41.05	41.1
Cesium (Cs)	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		<0.00040	<0.0050	2	0.0004	0.005	0.0027	0.0027
Cobalt (Co)	mg/L	0.004	0.0030	0.0131	2	0.0030	0.0131	0.0081	0.0081
Copper (Cu)	mg/L	0.022	0.00094	0.00069	2	0.00069	0.00094	0.00082	0.00082
Iron (Fe)	mg/L		0.137	0.02	1	0.02	0.137	0.0785	0.079
Lead (Pb)	mg/L	0.001	0.00037	<0.00010	2	0.0001	0.0004	0.0002	0.0002
Lithium (Li)	mg/L		---	0.0044	1	---	---	---	0.004
Magnesium (Mg)	mg/L		8.98	6.28	2	6.28	8.98	7.63	7.63
Manganese (Mn)	mg/L		0.612	0.485	2	0.485	0.612	0.549	0.549
Molybdenum (Mo)	mg/L	0.073	0.0156	<0.030	2	0.0156	0.030	0.023	0.023
Nickel (Ni)	mg/L		0.0159	<0.050	2	0.0159	0.05	0.033	0.033
Phosphorous (P)	mg/L		---	<0.010	1	---	---	---	0.01
Potassium (K)	mg/L		4.58	2.52	2	2.52	4.58	3.55	3.55
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00020	<0.010	2	0.0002	0.01	0.01	0.01
Sodium (Na)	mg/L		37.5	12.6	2	12.6	37.5	25.05	25.1
Strontium (Sr)	mg/L		0.119	0.11	2	0.11	0.119	0.11	0.11
Thallium (Tl)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Tin (Sn)	mg/L		0.00033	<0.030	2	0.00033	0.03	0.015	0.015
Titanium (Ti)	mg/L		0.00129	<0.010	2	0.00129	0.01	0.01	0.01
Uranium (U)	mg/L	0.027	0.0393	0.0510	2	0.0393	0.0510	0.0452	0.0452
Vanadium (V)	mg/L		0.00031	<0.0050	2	0.00031	0.005	0.002655	0.0027
Zinc (Zn)	mg/L	0.11	0.0036	<0.0050	2	0.0036	0.0050	0.0043	0.0043

Attachment 7.III.II-9
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-21	GA-10-21	Number of Samples	Minimum - GA-10-21	Maximum - GA-10-21	Median - GA-10-21	Average - GA-10-21
Date			12-Jun-10	15-Aug-10	2				
TOTAL METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	37.4	16.4	2	16.4	16.4	16.4	16.4
Antimony (Sb)	mg/L	0.03	0.0113	<0.2	2	0.0113	0.2	#NUM!	#DIV/0!
Arsenic (As)	mg/L	0.05	0.0161	0.00703	2	0.01	0.01	0.01	0.01
Barium (Ba)	mg/L		0.206	0.201	2	0.201	0.201	0.2	0.2
Beryllium (Be)	mg/L		0.0051	0.0051	2	0.0051	0.0051	0.01	0.01
Bismuth (Bi)	mg/L		0.00029	0.2	2	0.2	0.2	0.20	0.20
Boron (B)	mg/L		0.027	0.0273	2	0.0273	0.0273	0.027	0.027
Cadmium (Cd)	mg/L	0.00015	0.00070	0.0005	2	0.0005	0.0005	0.0005	0.0005
Calcium (Ca)	mg/L		45.5	37.2	2	37.2	37.2	37.2	37.2
Cesium	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.0195	0.00846	2	0.00846	0.00846	0.0	0.0
Cobalt (Co)	mg/L	0.004	0.0237	0.00973	2	0.0237	0.0097	0.0097	0.0097
Copper (Cu)	mg/L	0.022	0.0354	0.015	2	0.035	0.015	0.0	0.0
Iron (Fe)	mg/L		61.8	23.5	2	23.5	61.8	23.5	23.5
Lead (Pb)	mg/L	0.001	0.0379	0.011	2	0.011	0.011	0.0105	0.0105
Lithium (Li)	mg/L		---	0.026	1	---	---	---	0.026
Magnesium (Mg)	mg/L		25.6	11.6	2	11.6	11.6	11.6	11.6
Manganese (Mn)	mg/L		1.28	0.807	2	0.807	0.807	0.8	0.8
Molybdenum (Mo)	mg/L	0.073	0.0297	0.00838	2	0.008	0.008	0.0084	0.0084
Nickel (Ni)	mg/L		0.0391	0.0172	2	0.0172	0.0172	0.0172	0.0172
Potassium (K)	mg/L		23.9	9.4	2	9.4	9.4	9.4	9.4
Rubidium	mg/L		---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	0.00060	0.00047	2	0.00047	0.00047	0.00047	0.00047
Silver (Ag)	mg/L		0.0185	<0.01	2	0.01	0.01	0.0100	0.0100
Sodium (Na)	mg/L		41.0	13.8	2	13.8	13.8	13.8	13.8
Strontium (Sr)	mg/L		0.143	0.146	2	0.146	0.146	0.146	0.146
Thallium (Tl)	mg/L		0.00067	0.00045	2	0.00045	0.00045	0.00045	0.00045
Tin (Sn)	mg/L		0.00315	0.00143	2	0.00143	0.00315	0.00143	0.00143
Titanium (Ti)	mg/L		1.07	0.451	2	0.451	0.451	0.451	0.451
Uranium (U)	mg/L	0.027	0.0475	0.0562	2	0.0562	0.0562	0.0562	0.0562
Vanadium (V)	mg/L		0.0501	0.0209	2	0.0209	0.0209	0.0209	0.0209
Zinc (Zn)	mg/L	0.11	0.0504	0.0305	2	0.031	0.031	0.031	0.031

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Attachment 7.III.II-10
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-06-12	GA-06-12	GA-06-12	Number of Samples	Minimum - GA-06-12	Maximum - GA-06-12	Median - GA-06-12	Average - GA-06-12
Date			29-Aug-09	12-Jun-10	15-Aug-10	3				
GENERAL PARAMETERS										
pH	pH units		7.86	8.12	8.04	3	7.9	8.1	8.0	8.0
Conductivity	µS/cm		223	261	244	3	223	261	244	243
Alkalinity	mg/L as CaCO ₃		109	127	119	3	109	127	119	118
Hardness ²	mg/L as CaCO ₃		116	122	108	3	108	122	116	115
Bicarbonate (HCO ₃)	mg/L		133	155	145	3	133	155	145	144
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	< 5.0	3	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		160	137	139	3	137	160	139	145
ANIONS & NUTRIENTS										
Chloride (Cl)	mg/L	353	<0.50	<0.50	5.15	3	0.50	5.15	0.50	2.05
Sulphate (SO ₄)	mg/L	500	5.98	9.93	10.2	3	6	10	10	9
Fluoride (F)	mg/L		0.336	0.561	0.553	3	0.336	0.561	0.553	0.483
Phosphorous (P)	mg/L		0.078	0.036	0.064	3	0.036	0.078	0.064	0.06
Ammonia (NH ₃)	as N mg/L	0.5	<0.050	<0.050	<0.050	3	0.050	0.050	0.050	0.050
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	<0.050	3	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		0.103	0.052	0.291	3	0.052	0.291	0.103	0.15
DISSOLVED METALS (ICP-MS)										
Aluminum (Al)	mg/L	0.16	0.0078	<0.010	<0.20	3	0.008	0.2	0.01	0.073
Antimony (Sb)	mg/L	0.03	0.00072	0.00099	<0.20	3	0.0007	0.2	0.001	0.0672
Arsenic (As)	mg/L	0.05	<0.00040	<0.00040	<0.00040	3	0.000	0.000	0.000	0.000
Barium (Ba)	mg/L		0.0151	0.0176	0.014	3	0.014	0.0176	0.0151	0.0156
Beryllium (Be)	mg/L		<0.00050	<0.00050	<0.00050	3	0.0005	0.005	0.0005	0.002
Bismuth (Bi)	mg/L		<0.000050	<0.000050	<0.000050	3	0.00005	0.00005	0.00005	0.00005
Boron (B)	mg/L		0.0179	0.0238	0.0157	3	0.0157	0.0238	0.0179	0.019
Cadmium (Cd)	mg/L	0.00015	<0.000050	<0.00010	0.00006	3	0.00005	0.0001	0.0001	0.0001
Calcium (Ca)	mg/L		37.7	41.3	42.1	3	37.7	42.1	41.3	40.4
Cesium (Cs)	mg/L		---	---	---	0	---	---	---	---
Chromium (Cr)	mg/L		<0.00040	<0.00040	<0.00040	3	0.0004	0.0004	0.0004	0.0004
Cobalt (Co)	mg/L	0.004	0.00013	0.00122	<0.010	3	0.0001	0.0100	0.001	0.004
Copper (Cu)	mg/L	0.022	<0.00060	0.0006	<0.010	3	0.00060	0.01000	0.0006	0.004
Iron (Fe)	mg/L		---	---	<0.010	1	---	---	---	0.01
Lead (Pb)	mg/L	0.001	<0.00010	<0.00010	<0.050	3	0.00	0.05	0.00	0.02
Lithium (Li)	mg/L		<0.0030	---	<0.010	2	0.003	0.01	0.0065	0.007
Magnesium (Mg)	mg/L		4.22	4.48	4	3	4	4.48	4.22	4.2
Manganese (Mn)	mg/L		0.0269	0.0489	0.0233	3	0.0233	0.0489	0.0269	0.0330
Molybdenum (Mo)	mg/L	0.073	0.00594	0.00658	0.00553	3	0.0055	0.007	0.0059	0.006
Nickel (Ni)	mg/L		0.00071	0.00071	<0.050	3	0.00071	0.05	0.00071	0.02
Phosphorous (P)	mg/L		---	---	<0.10	1	---	---	---	0.1
Potassium (K)	mg/L		0.542	<0.50	0.536	3	0.5	0.542	0.536	0.53
Selenium (Se)	mg/L	0.0035	<0.00040	---	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00010	<0.00020	<0.010	3	0.0001	0.01	0.0002	0.003
Sodium (Na)	mg/L		2.76	3.5	2.43	3	2.43	3.5	2.8	2.9
Strontium (Sr)	mg/L		0.0977	0.111	0.0942	3	0.0942	0.111	0.1	0.1
Thallium (Tl)	mg/L		<0.000050	<0.000050	<0.20	3	0.00005	0.2	0.00005	0.07
Tin (Sn)	mg/L		<0.00020	<0.00020	<0.030	3	0.0002	0.03	0.0002	0.0101
Titanium (Ti)	mg/L		0.00049	0.00039	<0.010	3	0.00039	0.01	0.0005	0.004
Uranium (U)	mg/L	0.027	0.0491	0.0563	0.0504	3	0.0491	0.0563	0.0504	0.0519
Vanadium (V)	mg/L		0.00025	0.00021	0.00016	3	0.00016	0.00025	0.00021	0.0002
Zinc (Zn)	mg/L	0.11	0.0014	0.0015	0.0018	3	0.0014	0.0018	0.0015	0.0016

Attachment 7.III.II-10
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-06-12	GA-06-12	GA-06-12	Number of Samples	Minimum - GA-06-12	Maximum - GA-06-12	Median - GA-06-12	Average - GA-06-12
Date			29-Aug-09	12-Jun-10	15-Aug-10	3				
TOTAL METALS (ICP-MS)										
Aluminum (Al)	mg/L	0.16	3.4	28.3	6.6	3	3.4	28.3	5.0	5.0
Antimony (Sb)	mg/L	0.03	0.00069	0.00127	0.00079	3	0.001	0.001	0.001	0.001
Arsenic (As)	mg/L	0.05	0.00139	0.0107	0.00235	3	0.00	0.00	0.00	0.00
Barium (Ba)	mg/L		0.0472	0.240	0.0463	3	0.0463	0.0472	0.04675	0.047
Beryllium (Be)	mg/L		<0.0010	0.0027	<0.0010	3	0.001	0.001	0.001	0.0010
Bismuth (Bi)	mg/L		<0.00020	0.00053	<0.20	3	0.0002	0.2	0.1001	0.10
Boron (B)	mg/L		<0.020	0.043	0.021	3	0.02	0.021	0.0205	0.02
Cadmium (Cd)	mg/L	0.00015	<0.00020	0.00032	0.0045	3	0.0002	0.0045	0.0023	0.0023
Calcium (Ca)	mg/L		43.4	---	46.5	2	43.4	46.5	44.95	45.0
Cesium	mg/L		---	---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.00202	0.0201	0.00302	3	0.00202	0.00302	0.00252	0.003
Cobalt (Co)	mg/L	0.004	0.00114	0.0116	<0.010	3	0.0011	0.0100	0.0056	0.0056
Copper (Cu)	mg/L	0.022	0.0162	0.110	0.0177	3	0.016	0.018	0.017	0.017
Iron (Fe)	mg/L		4.12	32.3	4.55	3	4.12	4.55	4.335	4.34
Lead (Pb)	mg/L	0.001	0.004	0.0311	<0.050	3	0.004	0.050	0.027	0.027
Lithium (Li)	mg/L		---	---	0.0074	1	---	---	---	0.007
Magnesium (Mg)	mg/L		5.95	17.4	5.56	3	5.56	5.95	5.755	5.8
Manganese (Mn)	mg/L		0.213	1.45	0.201	3	0.201	0.213	0.207	0.207
Molybdenum (Mo)	mg/L	0.073	0.00455	0.00741	<0.030	3	0.005	0.030	0.017	0.017
Nickel (Ni)	mg/L		0.00287	0.0191	<0.050	3	0.00287	0.05	0.026435	0.0264
Potassium (K)	mg/L		1.71	8.20	2.24	3	1.71	2.24	1.975	2.0
Rubidium	mg/L		---	---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	0.00051	<0.00040	<0.00040	3	0.0004	0.00051	0.0004	0.0004
Silver (Ag)	mg/L		0.00411	0.0525	0.00363	3	0.00363	0.00411	0.00387	0.004
Sodium (Na)	mg/L		3.5	6.3	2.88	3	2.88	3.5	3.19	3.2
Strontium (Sr)	mg/L		0.0927	0.208	0.114	3	0.0927	0.114	0.10335	0.103
Thallium (Tl)	mg/L		<0.00010	0.00040	<0.20	3	0.0001	0.2	0.10005	0.1001
Tin (Sn)	mg/L		0.00056	0.00234	0.00061	3	0.00056	0.00061	0.000585	0.00
Titanium (Ti)	mg/L		0.0728	0.346	0.094	3	0.0728	0.094	0.0834	0.083
Uranium (U)	mg/L	0.027	0.0420	0.0640	0.0518	3	0.0420	0.0518	0.0469	0.05
Vanadium (V)	mg/L		0.0045	0.0416	0.00537	3	0.0045	0.00537	0.004935	0.005
Zinc (Zn)	mg/L	0.11	0.0149	0.124	0.0165	3	0.015	0.017	0.016	0.016

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Attachment 7.III.II-11
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-18S	GA-10-18S	Number of Samples	Minimum - GA-10-18S	Maximum - GA-10-18S	Median - GA-10-18S	Average - GA-10-18S
Date			12-Jun-10	15-Aug-10	2				
GENERAL PARAMETERS									
pH	pH units		7.31	6.59	2	6.6	7.3	7.0	7.0
Conductivity	µS/cm		106	269	2	106	269	187.5	188
Alkalinity	mg/L as CaCO ₃		36.9	126	2	36.9	126	81.45	81
Hardness ²	mg/L as CaCO ₃		32.6	104	2	32.6	104	68.3	68
Bicarbonate (HCO ₃)	mg/L		45	154	2	45	154	99.5	100
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	2	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		62	150	2	62	150	106	106
ANIONS & NUTRIENTS									
Chloride (Cl)	mg/L	353	0.69	5.67	2	0.69	5.67	3.18	3.18
Sulphate (SO ₄)	mg/L	500	15.3	12.4	2	12	15	14	14
Fluoride (F)	mg/L		0.056	0.083	2	0.056	0.083	0.0695	0.070
Phosphorous (P)	mg/L		1.46	2.08	2	1.46	2.08	1.77	1.77
Ammonia (NH ₃)	as N mg/L	0.5	0.215	0.433	2	0.215	0.433	0.324	0.324
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	2	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		<0.050	0.096	2	0.05	0.096	0.073	0.07
DISSOLVED METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	0.194	0.206	2	0.194	0.206	0.200	0.200
Antimony (Sb)	mg/L	0.03	<0.00040	<0.20	2	0.0004	0.2	0.1	0.1
Arsenic (As)	mg/L	0.05	0.0152	0.0213	2	0.015	0.021	0.018	0.018
Barium (Ba)	mg/L		0.0143	0.042	2	0.0143	0.042	0.028	0.028
Beryllium (Be)	mg/L		<0.00050	<0.00050	2	0.0005	0.0005	0.0005	0.0005
Bismuth (Bi)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Boron (B)	mg/L		0.0097	0.0234	2	0.0097	0.0234	0.02	0.02
Cadmium (Cd)	mg/L	0.00015	<0.00010	<0.010	2	0.0001	0.01	0.005	0.005
Calcium (Ca)	mg/L		8.58	29.2	2	8.58	29.2	18.89	18.9
Cesium (Cs)	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.0006	<0.0050	2	0.0006	0.005	0.003	0.003
Cobalt (Co)	mg/L	0.004	0.0036	0.0100	2	0.0036	0.0100	0.007	0.007
Copper (Cu)	mg/L	0.022	0.00649	0.0161	2	0.0065	0.016	0.011	0.011
Iron (Fe)	mg/L		0.292	0.538	1	0.292	0.538	0.415	0.42
Lead (Pb)	mg/L	0.001	0.00019	<0.050	2	0.00	0.05	0.03	0.03
Lithium (Li)	mg/L		---	0.0036	2	---	---	---	0.004
Magnesium (Mg)	mg/L		2.72	8	2	2.72	8	5.36	5.4
Manganese (Mn)	mg/L		0.267	0.728	2	0.267	0.728	0.498	0.498
Molybdenum (Mo)	mg/L	0.073	0.00158	<0.030	2	0.0016	0.030	0.0158	0.0158
Nickel (Ni)	mg/L		0.00541	0.0236	2	0.00541	0.0236	0.0145	0.0145
Phosphorous (P)	mg/L		---	0.2	1	---	---	---	0.2
Potassium (K)	mg/L		1.75	1.94	2	1.75	1.94	1.85	1.85
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00020	<0.00010	2	0.0001	0.0002	0.0002	0.0002
Sodium (Na)	mg/L		10.8	17.2	2	10.8	17.2	14	14
Strontium (Sr)	mg/L		0.0346	0.0862	2	0.0346	0.0862	0.0604	0.0604
Thallium (Tl)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Tin (Sn)	mg/L		<0.00020	<0.00020	2	0.0002	0.0002	0.0002	0.0002
Titanium (Ti)	mg/L		0.00517	0.0024	2	0.0024	0.00517	0.0038	0.0038
Uranium (U)	mg/L	0.027	0.00048	0.00088	2	0.0005	0.0009	0.0007	0.0007
Vanadium (V)	mg/L		0.0008	0.00081	2	0.0008	0.00081	0.00081	0.00081
Zinc (Zn)	mg/L	0.11	0.0048	0.0265	2	0.0048	0.0265	0.0157	0.0157

Attachment 7.III.II-11
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-18S	GA-10-18S	Number of Samples	Minimum - GA-10-18S	Maximum - GA-10-18S	Median - GA-10-18S	Average - GA-10-18S
Date			12-Jun-10	15-Aug-10	2				
TOTAL METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	75.8	113.0	2	76	113	94	94
Antimony (Sb)	mg/L	0.03	0.001	0.001	2	0.001	0.001	0.001	0.001
Arsenic (As)	mg/L	0.05	0.36	0.77	2	0.36	0.77	0.56	0.56
Barium (Ba)	mg/L		0.639	1.33	2	0.64	1.33	0.98	0.98
Beryllium (Be)	mg/L		0.0044	0.0294	2	0.004	0.029	0.017	0.017
Bismuth (Bi)	mg/L		0.00179	0.00278	2	0.00179	0.00278	0.00229	0.00229
Boron (B)	mg/L		0.037	<0.1	2	0.037	0.0	0.0	0.0
Cadmium (Cd)	mg/L	0.00015	0.0014	0.0015	2	0.0014	0.0015	0.0015	0.0015
Calcium (Ca)	mg/L		39.6	57.2	2	39.6	57.2	48.4	48.4
Cesium	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.147	0.247	2	0.147	0.247	0.197	0.197
Cobalt (Co)	mg/L	0.004	0.079	0.108	2	0.079	0.108	0.093	0.093
Copper (Cu)	mg/L	0.022	0.151	0.293	2	0.151	0.293	0.222	0.222
Iron (Fe)	mg/L		99.4	150	2	99	150	125	125
Lead (Pb)	mg/L	0.001	0.049	0.107	2	0.0486	0.1070	0.0778	0.0778
Lithium (Li)	mg/L		---	0.13	1	---	---	---	0.13
Magnesium (Mg)	mg/L		41.4	61.9	2	41.4	61.9	51.7	51.7
Manganese (Mn)	mg/L		1.97	3.5	2	2.0	3.5	2.7	2.7
Molybdenum (Mo)	mg/L	0.073	0.004	0.006	2	0.004	0.006	0.005	0.005
Nickel (Ni)	mg/L		0.127	0.162	2	0.127	0.162	0.145	0.145
Potassium (K)	mg/L		18.1	17.7	2	17.7	18.1	17.9	17.9
Rubidium	mg/L		---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	0.00049	0.00119	2	0.000	0.001	0.001	0.001
Silver (Ag)	mg/L		0.00721	<0.010	2	0.007	0.007	0.01	0.01
Sodium (Na)	mg/L		12.6	20.1	2	12.600	20.100	16.4	16.4
Strontium (Sr)	mg/L		0.249	0.386	2	0.249	0.386	0.318	0.318
Thallium (Tl)	mg/L		0.00153	<0.20	2	0.002	0.002	0.002	0.002
Tin (Sn)	mg/L		0.00069	0.00076	2	0.00069	0.00076	0.00073	0.00073
Titanium (Ti)	mg/L		1.5	1.78	2	1.5	1.78	1.64	1.64
Uranium (U)	mg/L	0.027	0.0222	0.0369	2	0.0222	0.0369	0.0296	0.0296
Vanadium (V)	mg/L		0.126	0.233	2	0.126	0.233	0.18	0.18
Zinc (Zn)	mg/L	0.11	0.275	0.362	2	0.2750	0.3620	0.3185	0.3185

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-18D
Date			15-Aug-10
GENERAL PARAMETERS			
pH	pH units		7.59
Conductivity	µS/cm		497
Alkalinity	mg/L as CaCO ₃		222
Hardness ²	mg/L as CaCO ₃		173
Bicarbonate (HCO ₃)	mg/L		270
Carbonate (CO ₃)	mg/L		< 5.0
Total Dissolved Solids (TDS)	mg/L		275
ANIONS & NUTRIENTS			
Chloride (Cl)	mg/L	353	2.68
Sulphate (SO ₄)	mg/L	500	47.4
Fluoride (F)	mg/L		0.283
Phosphorous (P)	mg/L		3.18
Ammonia (NH ₃)	as N mg/L	0.5	0.639
Nitrite (NO ₂)	as N mg/L		<0.050
Nitrate (NO ₃)	as N mg/L		0.11
DISSOLVED METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	0.198
Antimony (Sb)	mg/L	0.03	<0.20
Arsenic (As)	mg/L	0.05	0.0825
Barium (Ba)	mg/L		0.0428
Beryllium (Be)	mg/L		<0.0050
Bismuth (Bi)	mg/L		<0.20
Boron (B)	mg/L		0.012
Cadmium (Cd)	mg/L	0.00015	<0.010
Calcium (Ca)	mg/L		58.9
Cesium (Cs)	mg/L		---
Chromium (Cr)	mg/L		0.00069
Cobalt (Co)	mg/L	0.004	0.0193
Copper (Cu)	mg/L	0.022	0.00119
Iron (Fe)	mg/L		0.403
Lead (Pb)	mg/L	0.001	0.00012
Lithium (Li)	mg/L		<0.0030
Magnesium (Mg)	mg/L		13.4
Manganese (Mn)	mg/L		1.35
Molybdenum (Mo)	mg/L	0.073	0.00293
Nickel (Ni)	mg/L		<0.050
Phosphorous (P)	mg/L		0.13
Potassium (K)	mg/L		4.4
Selenium (Se)	mg/L	0.0035	<0.00040
Silver (Ag)	mg/L		<0.00010
Sodium (Na)	mg/L		12.3
Strontium (Sr)	mg/L		0.0919
Thallium (Tl)	mg/L		<0.20
Tin (Sn)	mg/L		<0.030
Titanium (Ti)	mg/L		0.00773
Uranium (U)	mg/L	0.027	0.00451
Vanadium (V)	mg/L		0.00362
Zinc (Zn)	mg/L	0.11	<0.0050
TOTAL METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	323
Antimony (Sb)	mg/L	0.03	<0.20
Arsenic (As)	mg/L	0.05	0.98
Barium (Ba)	mg/L		2.33
Beryllium (Be)	mg/L		0.0684
Bismuth (Bi)	mg/L		0.00568
Boron (B)	mg/L		0.0349
Cadmium (Cd)	mg/L	0.00015	0.00553
Calcium (Ca)	mg/L		63
Cesium	mg/L		---
Chromium (Cr)	mg/L		0.659
Cobalt (Co)	mg/L	0.004	0.281
Copper (Cu)	mg/L	0.022	1.43
Iron (Fe)	mg/L		402
Lead (Pb)	mg/L	0.001	0.0826
Lithium (Li)	mg/L		0.544
Magnesium (Mg)	mg/L		157
Manganese (Mn)	mg/L		5.99
Molybdenum (Mo)	mg/L	0.073	0.037
Nickel (Ni)	mg/L		0.531
Potassium (K)	mg/L		41.3
Rubidium	mg/L		---
Selenium (Se)	mg/L	0.0035	0.00274
Silver (Ag)	mg/L		<0.010
Sodium (Na)	mg/L		11.3
Strontium (Sr)	mg/L		0.3
Thallium (Tl)	mg/L		<0.20
Tin (Sn)	mg/L		<0.030
Titanium (Ti)	mg/L		9.69
Uranium (U)	mg/L	0.027	0.0396
Vanadium (V)	mg/L		0.662
Zinc (Zn)	mg/L	0.11	0.904

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess

Attachment 7.III.II-13
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-27S	GA-10-27S	Number of Samples	Minimum - GA-10-27S	Maximum - GA-10-27S	Median - GA-10-27S	Average - GA-10-27S
Date			16-Jun-10	14-Aug-10	2				
GENERAL PARAMETERS									
pH	pH units		8.23	8.1	2	8.1	8.2	8.2	8.2
Conductivity	µS/cm		469	382	2	382	469	425.5	426
Alkalinity	mg/L as CaCO ₃		252	211	2	211	252	231.5	232
Hardness ²	mg/L as CaCO ₃		240	189	2	189	240	214.5	215
Bicarbonate (HCO ₃)	mg/L		308	258	2	258	308	283	283
Carbonate (CO ₃)	mg/L		<5	<5	2	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		248	207	2	207	248	227.5	228
ANIONS & NUTRIENTS									
Chloride (Cl)	mg/L	353	2.1	5.83	2	2.1	5.83	4.0	4.0
Sulphate (SO ₄)	mg/L	500	2.23	2.13	2	2.13	2.23	2.18	2.18
Fluoride (F)	mg/L		0.072	0.334	2	0.072	0.334	0.20	0.20
Phosphorous (P)	mg/L		2.63	0.88	2	0.88	2.63	1.76	1.76
Ammonia (NH ₃)	as N mg/L	0.5	0.558	0.407	2	0.407	0.558	0.483	0.483
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	2	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		<0.050	0.116	2	0.05	0.116	0.08	0.08
DISSOLVED METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	0.023	<0.2	2	0.200	0.023	0.1	0.1
Antimony (Sb)	mg/L	0.03	0.00113	0.00054	2	0.0005	0.0011	0.00084	0.00084
Arsenic (As)	mg/L	0.05	0.011	0.00568	2	0.006	0.011	0.0083	0.0083
Barium (Ba)	mg/L		0.0466	0.0296	2	0.0296	0.0466	0.0381	0.0381
Beryllium (Be)	mg/L		<0.00050	<0.00050	2	0.0005	0.005	0.003	0.003
Bismuth (Bi)	mg/L		<0.000050	<0.000050	2	0.00005	0.00005	0.00005	0.00005
Boron (B)	mg/L		0.0175	0.0144	2	0.0144	0.0175	0.016	0.016
Cadmium (Cd)	mg/L	0.00015	0.0001	<0.010	2	0.0001	0.010	0.005	0.005
Calcium (Ca)	mg/L		57.8	45.3	2	45.3	57.8	51.6	51.6
Cesium (Cs)	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.00074	<0.0050	2	0.00074	0.005	0.003	0.003
Cobalt (Co)	mg/L	0.004	0.0005	0.0140	2	0.0005	0.0140	0.0073	0.0073
Copper (Cu)	mg/L	0.022	0.00197	<0.00060	2	0.00060	0.00197	0.00129	0.00129
Iron (Fe)	mg/L		0.044	0.124	1	0.044	0.124	0.084	0.084
Lead (Pb)	mg/L	0.001	<0.00010	<0.00010	2	0.0001	0.0001	0.0001	0.0001
Lithium (Li)	mg/L		---	0.0034	1	---	---	---	0.0034
Magnesium (Mg)	mg/L		23.2	18.4	2	18.4	23.2	20.8	20.8
Manganese (Mn)	mg/L		0.367	0.325	2	0.325	0.367	0.346	0.346
Molybdenum (Mo)	mg/L	0.073	0.0557	0.00677	2	0.0068	0.056	0.0312	0.0312
Nickel (Ni)	mg/L		0.00501	0.00226	2	0.00226	0.00501	0.00364	0.00364
Phosphorous (P)	mg/L		< 0.01	< 0.01	1	0.01	0.01	0.01	0.01
Potassium (K)	mg/L		5.16	3.58	2	3.58	5.16	4.37	4.37
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00010	<0.010	2	0.0001	0.01	0.005	0.005
Sodium (Na)	mg/L		6.1	4.4	2	4.4	6.1	5.3	5.3
Strontium (Sr)	mg/L		0.353	0.287	2	0.287	0.353	0.32	0.32
Thallium (Tl)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Tin (Sn)	mg/L		<0.00020	<0.00020	2	0.0002	0.0002	0.0002	0.0002
Titanium (Ti)	mg/L		0.00114	<0.010	2	0.00114	0.01	0.00557	0.0056
Uranium (U)	mg/L	0.027	0.0512	0.0063	2	0.0063	0.0512	0.0288	0.0288
Vanadium (V)	mg/L		0.00044	0.00011	2	0.00011	0.00044	0.00028	0.00028
Zinc (Zn)	mg/L	0.11	<0.0010	<0.0050	2	0.0010	0.0050	0.003	0.003

Attachment 7.III.II-13
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-27S	GA-10-27S	Number of Samples	Minimum - GA-10-27S	Maximum - GA-10-27S	Median - GA-10-27S	Average - GA-10-27S
Date			16-Jun-10	14-Aug-10	2				
TOTAL METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	50.0	23.7	2	23.7	50.0	36.9	36.9
Antimony (Sb)	mg/L	0.03	0.00254	0.00165	2	0.002	0.0	0.0021	0.0021
Arsenic (As)	mg/L	0.05	0.18	0.08	2	0.08	0.18	0.13	0.13
Barium (Ba)	mg/L		0.34	0.235	2	0.235	0.34	0.29	0.29
Beryllium (Be)	mg/L		0.0035	0.0015	2	0.0015	0.0035	0.0025	0.0025
Bismuth (Bi)	mg/L		0.00936	0.00542	2	0.00542	0.00936	0.00739	0.00739
Boron (B)	mg/L		0.025	0.0219	2	0.0219	0.025	0.023	0.023
Cadmium (Cd)	mg/L	0.00015	0.0006	0.0002	2	0.0002	0.0006	0.0004	0.0004
Calcium (Ca)	mg/L		69.7	58.3	2	58.3	69.7	64	64
Cesium	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.0844	0.0383	2	0.0383	0.0844	0.0614	0.061
Cobalt (Co)	mg/L	0.004	0.0353	0.0148	2	0.0148	0.0353	0.0251	0.0251
Copper (Cu)	mg/L	0.022	0.527	0.132	2	0.132	0.527	0.330	0.330
Iron (Fe)	mg/L		89.7	35.5	2	35.5	89.7	62.6	62.6
Lead (Pb)	mg/L	0.001	0.018	<0.050	2	0.018	0.018	0.018	0.018
Lithium (Li)	mg/L		---	0.049	1	---	---	---	0.049
Magnesium (Mg)	mg/L		62.3	33	2	33	62.3	47.65	47.7
Manganese (Mn)	mg/L		1.1	0.685	2	0.685	1.1	0.89	0.89
Molybdenum (Mo)	mg/L	0.073	0.196	0.044	2	0.044	0.196	0.12	0.12
Nickel (Ni)	mg/L		0.102	<0.050	2	0.102	0.102	0.1	0.1
Potassium (K)	mg/L		---	9.94	1	---	---	---	9.9
Rubidium	mg/L		---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	<0.00040	0.00076	2	0.00076	0.00076	0.0008	0.0008
Silver (Ag)	mg/L		0.303	0.0308	2	0.0308	0.303	0.167	0.167
Sodium (Na)	mg/L		6.8	4.7	2	4.7	6.8	5.8	5.8
Strontium (Sr)	mg/L		0.407	0.327	2	0.327	0.407	0.367	0.367
Thallium (Tl)	mg/L		0.00102	0.00037	2	0.00037	0.00102	0.0007	0.0007
Tin (Sn)	mg/L		0.0022	<0.030	2	0.0022	0.0022	0.002	0.002
Titanium (Ti)	mg/L		2.07	0.718	2	0.718	2.07	1.39	1.39
Uranium (U)	mg/L	0.027	0.11	0.10	2	0.10	0.11	0.1	0.1
Vanadium (V)	mg/L		0.087	0.0415	2	0.0415	0.087	0.06425	0.064
Zinc (Zn)	mg/L	0.11	0.0978	0.0417	2	0.042	0.098	0.07	0.07

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Attachment 7.III.II-14
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-27D	GA-10-27D	Number of Samples	Minimum - GA-10-27D	Maximum - GA-10-27D	Median - GA-10-27D	Average - GA-10-27D
Date			16-Jun-10	14-Aug-10	2				
GENERAL PARAMETERS									
pH	pH units		8.3	8.24	2	8.2	8.3	8.3	8.3
Conductivity	µS/cm		337	336	2	336	337	337	337
Alkalinity	mg/L as CaCO ₃		143	140	2	140	143	142	142
Hardness ²	mg/L as CaCO ₃		157	146	2	146	157	152	152
Bicarbonate (HCO ₃)	mg/L		172	171	2	171	172	172	172
Carbonate (CO ₃)	mg/L		< 5.0	< 5.0	2	5	5	5	5
Total Dissolved Solids (TDS)	mg/L		184	197	2	184	197	191	191
ANIONS & NUTRIENTS									
Chloride (Cl)	mg/L	353	0.86	5.15	2	0.86	5.15	3.01	3.01
Sulphate (SO ₄)	mg/L	500	35.3	37.1	2	35	37	36	36
Fluoride (F)	mg/L		0.321	0.466	2	0.321	0.466	0.394	0.394
Phosphorous (P)	mg/L		0.123	0.08	2	0.08	0.123	0.10	0.10
Ammonia (NH ₃)	as N mg/L	0.5	<0.050	<0.050	2	0.050	0.050	0.05	0.05
Nitrite (NO ₂)	as N mg/L		<0.050	<0.050	2	0.05	0.05	0.05	0.05
Nitrate (NO ₃)	as N mg/L		<0.050	0.111	2	0.05	0.111	0.0805	0.08
DISSOLVED METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	0.005	<0.2	2	0.005	0.200	0.1	0.1
Antimony (Sb)	mg/L	0.03	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Arsenic (As)	mg/L	0.05	0.0035	0.00334	2	0.003	0.004	0.00342	0.00342
Barium (Ba)	mg/L		0.0208	0.0221	2	0.0208	0.0221	0.0215	0.0215
Beryllium (Be)	mg/L		<0.00050	<0.0050	2	0.0005	0.005	0.003	0.003
Bismuth (Bi)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Boron (B)	mg/L		0.0255	0.0218	2	0.0218	0.0255	0.02365	0.024
Cadmium (Cd)	mg/L	0.00015	0.0001	<0.000050	2	0.00005	0.0001	0.0001	0.0001
Calcium (Ca)	mg/L		40.2	39.7	2	39.7	40.2	39.95	40.0
Cesium (Cs)	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Cobalt (Co)	mg/L	0.004	0.0002	<0.010	2	0.0002	0.0100	0.005	0.005
Copper (Cu)	mg/L	0.022	<0.00060	<0.00060	2	0.00060	0.00060	0.0006	0.0006
Iron (Fe)	mg/L		<0.010	<0.010	1	0.01	0.01	0.01	0.01
Lead (Pb)	mg/L	0.001	<0.00010	<0.00010	2	0.00	0.00	0.0001	0.0001
Lithium (Li)	mg/L		---	<0.010	1	---	---	---	0.01
Magnesium (Mg)	mg/L		13.6	13.9	2	13.6	13.9	13.8	13.8
Manganese (Mn)	mg/L		0.0555	0.106	2	0.0555	0.106	0.0808	0.0808
Molybdenum (Mo)	mg/L	0.073	0.0245	0.00509	2	0.0051	0.025	0.0148	0.0148
Nickel (Ni)	mg/L		0.00127	<0.050	2	0.00127	0.05	0.03	0.03
Phosphorous (P)	mg/L		<0.010	<0.10	1	---	---	---	---
Potassium (K)	mg/L		1.11	1.23	2	1.11	1.23	1.17	1.17
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		<0.00010	<0.00010	2	0.0001	0.0001	0.0001	0.0001
Sodium (Na)	mg/L		7.1	6.86	2	6.86	7.1	7.0	7.0
Strontium (Sr)	mg/L		0.563	0.487	2	0.487	0.563	0.525	0.5250
Thallium (Tl)	mg/L		<0.000050	<0.20	2	0.00005	0.2	0.1	0.1
Tin (Sn)	mg/L		<0.00020	<0.030	2	0.0002	0.03	0.02	0.02
Titanium (Ti)	mg/L		0.00053	<0.010	2	0.00053	0.01	0.005	0.005
Uranium (U)	mg/L	0.027	0.0127	0.0129	2	0.0127	0.0129	0.0128	0.0128
Vanadium (V)	mg/L		<0.00010	<0.0050	2	0.0001	0.005	0.003	0.003
Zinc (Zn)	mg/L	0.11	<0.0010	<0.0050	2	0.0010	0.0050	0.003	0.003

Attachment 7.III.II-14
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	GA-10-27D	GA-10-27D	Number of Samples	Minimum - GA-10-27D	Maximum - GA-10-27D	Median - GA-10-27D	Average - GA-10-27D
Date			16-Jun-10	14-Aug-10	2				
TOTAL METALS (ICP-MS)									
Aluminum (Al)	mg/L	0.16	3.1	2.0	2	2.0	2.0	2.0	2.0
Antimony (Sb)	mg/L	0.03	0.00097	0.0005	2	0.001	0.0	0.001	0.001
Arsenic (As)	mg/L	0.05	0.00841	0.0106	2	0.01	0.01	0.0106	0.0106
Barium (Ba)	mg/L		0.0567	0.0414	2	0.0414	0.0567	0.0491	0.0491
Beryllium (Be)	mg/L		<0.0010	<0.0050	2	0.001	0.005	0.003	0.003
Bismuth (Bi)	mg/L		<0.00020	<0.00020	2	0.0002	0.0002	0.0002	0.0002
Boron (B)	mg/L		0.0266	<0.10	2	0.1	0.1	0.1	0.1
Cadmium (Cd)	mg/L	0.00015	0.00007	<0.01	2	0.0001	0.010	0.005	0.005
Calcium (Ca)	mg/L		42	40.3	2	40.3	42	41	41
Cesium	mg/L		---	---	0	---	---	---	---
Chromium (Cr)	mg/L		0.00337	<0.0050	2	0.005	0.005	0.005	0.005
Cobalt (Co)	mg/L	0.004	0.00067	0.01	2	0.0007	0.01	0.005	0.005
Copper (Cu)	mg/L	0.022	0.0309	0.0171	2	0.017	0.017	0.017	0.017
Iron (Fe)	mg/L		2.42	1.89	2	1.89	1.89	1.89	1.89
Lead (Pb)	mg/L	0.001	0.001	<0.05	2	0.001	0.05	0.03	0.03
Lithium (Li)	mg/L		---	<0.010	1	---	---	---	0.01
Magnesium (Mg)	mg/L		14.6	14.6	2	14.6	14.6	14.6	14.6
Manganese (Mn)	mg/L		0.1	0.113	2	0.113	0.113	0.1	0.1
Molybdenum (Mo)	mg/L	0.073	0.0326	0.0173	2	0.017	0.017	0.0173	0.0173
Nickel (Ni)	mg/L		0.00237	0.00246	2	0.00246	0.00246	0.00246	0.00246
Potassium (K)	mg/L		3.99	2.48	2	2.48	2.48	2.48	2.48
Rubidium	mg/L		---	---	0	---	---	---	---
Selenium (Se)	mg/L	0.0035	<0.00040	<0.00040	2	0.0004	0.0004	0.0004	0.0004
Silver (Ag)	mg/L		0.027	0.0144	2	0.0144	0.0144	0.014	0.014
Sodium (Na)	mg/L		7	7.7	2	7.7	7.7	8	8
Strontium (Sr)	mg/L		0.556	0.549	2	0.549	0.549	0.549	0.549
Thallium (Tl)	mg/L		<0.00010	<0.20	2	0.0001	0.2	0.1	0.1
Tin (Sn)	mg/L		<0.00040	0.00057	2	0.0004	0.00057	0.0005	0.0005
Titanium (Ti)	mg/L		0.028	0.0225	2	0.0225	0.0225	0.0225	0.023
Uranium (U)	mg/L	0.027	0.0131	0.0136	2	0.0136	0.0136	0.0136	0.0136
Vanadium (V)	mg/L		0.00328	<0.0050	2	0.005	0.005	0.005	0.005
Zinc (Zn)	mg/L	0.11	0.0044	0.0058	2	0.006	0.006	0.006	0.006

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

Attachment 7.III.II-15
Detailed Results - Groundwater Quality

PARAMETER	UNITS	Site Specific Water Quality Objectives	10-287
Date			09-Apr-10
GENERAL PARAMETERS			
pH	pH units		---
Conductivity	µS/cm		---
Alkalinity	mg/L as CaCO ₃		---
Hardness ²	mg/L as CaCO ₃		167
Bicarbonate (HCO ₃)	mg/L		---
Carbonate (CO ₃)	mg/L		---
Total Dissolved Solids (TDS)	mg/L		---
TOTAL METALS (ICP-MS)			
Aluminum (Al)	mg/L	0.16	1.36
Antimony (Sb)	mg/L	0.03	0.00711
Arsenic (As)	mg/L	0.05	0.0184
Barium (Ba)	mg/L		0.0539
Beryllium (Be)	mg/L		<0.0010
Bismuth (Bi)	mg/L		---
Boron (B)	mg/L		<0.050
Cadmium (Cd)	mg/L	0.00015	<0.000060
Calcium (Ca)	mg/L		44
Cesium	mg/L		---
Chromium (Cr)	mg/L		0.004
Cobalt (Co)	mg/L	0.004	<0.0020
Copper (Cu)	mg/L	0.022	0.0073
Iron (Fe)	mg/L		3.52
Lead (Pb)	mg/L	0.001	0.0022
Lithium (Li)	mg/L		0.012
Magnesium (Mg)	mg/L		13.8
Manganese (Mn)	mg/L		0.0506
Molybdenum (Mo)	mg/L	0.073	0.0151
Nickel (Ni)	mg/L		0.0026
Potassium (K)	mg/L		14.3
Rubidium	mg/L		---
Selenium (Se)	mg/L	0.0035	<0.00040
Silver (Ag)	mg/L		0.00018
Sodium (Na)	mg/L		28.7
Strontium (Sr)	mg/L		---
Thallium (Tl)	mg/L		<0.00010
Tin (Sn)	mg/L		<0.050
Titanium (Ti)	mg/L		0.0712
Uranium (U)	mg/L	0.027	0.00533
Vanadium (V)	mg/L		0.002
Zinc (Zn)	mg/L	0.11	<0.0040

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives

PARAMETER	UNITS	Site Specific Water Quality Objectives	SEEP 1	SEEP1	SEEP1	SEEP 1
Date			2-Aug-07	17-Jun-10	20-Jul-10	08-SEP-10
GENERAL PARAMETERS						
pH	pH units		-	8.14	7.94	7.89
Conductivity	µS/cm		-	393	403	426
Alkalinity	mg/L as CaCO ₃		40.1	107	105	113
Hardness ²	mg/L as CaCO ₃		361	173	168	169
Bicarbonate (HCO ₃)	mg/L		48.9	130	129	138
Carbonate (CO ₃)	mg/L		<0.5	<5.0	<5.0	<5.0
Total Dissolved Solids (TDS)	mg/L				239	260
ANIONS & NUTRIENTS						
Chloride (Cl)	mg/L	353	8.8	1.52	1.18	2.47
Sulphate (SO ₄)	mg/L	500	37.6	51.4	41.5	43.7
Fluoride (F)	mg/L			0.139	0.163	0.122
Phosphorous (P)	mg/L				0.144	0.021
Ammonia (NH ₃)	as N mg/L	0.5	5.5	<0.050	<0.050	<0.050
Nitrite (NO ₂)	as N mg/L		0.374	<0.050	<0.050	<0.050
Nitrate (NO ₃)	as N mg/L		98.3	11.9	13	16.3
DISSOLVED METALS (ICP-MS)						
Aluminum (Al)	mg/L	0.16	0.0211	---	0.0172	0.016
Antimony (Sb)	mg/L	0.03	0.00189	---	0.00183	0.00141
Arsenic (As)	mg/L	0.05	0.0228	---	0.0298	0.0369
Barium (Ba)	mg/L		0.0413	---	0.011	0.0122
Beryllium (Be)	mg/L		<0.00005	---	<0.00050	<0.00050
Bismuth (Bi)	mg/L		<0.00005	---	<0.000050	<0.000050
Boron (B)	mg/L		0.024	---	0.0175	0.0162
Cadmium (Cd)	mg/L	0.00015	0.00002	---	<0.000050	<0.00010
Calcium (Ca)	mg/L		98.7	46.5	38.1	45.2
Cesium (Cs)	mg/L			---	---	
Chromium (Cr)	mg/L		<0.0002	---	<0.00040	<0.00040
Cobalt (Co)	mg/L	0.004	0.0106	---	<0.010	0.00351
Copper (Cu)	mg/L	0.022	0.0032	---	0.00501	0.00354
Iron (Fe)	mg/L		0.021	---	0.012	<0.010
Lead (Pb)	mg/L	0.001	0.00007	---	<0.050	<0.00010
Lithium (Li)	mg/L		0.0029	---	<0.010	
Magnesium (Mg)	mg/L		27.8	13.8	12.6	13.6
Manganese (Mn)	mg/L		0.00434	---	<0.0020	<0.0020
Molybdenum (Mo)	mg/L	0.073	0.0042	---	<0.030	0.00847
Nickel (Ni)	mg/L		<0.0005	---	<0.050	0.00115
Phosphorous (P)	mg/L		0.01	---	<0.010	
Potassium (K)	mg/L		8.57	3.98	3.43	3.48
Selenium (Se)	mg/L	0.0035	<0.0005	---	<0.20	<0.00040
Silver (Ag)	mg/L		<0.00001	---	<0.00010	<0.00020
Sodium (Na)	mg/L		30.9	11.6	12.2	11.9
Strontium (Sr)	mg/L		0.171	---	0.0725	0.0795
Thallium (Tl)	mg/L		<0.00005	---	<0.000050	<0.000050
Tin (Sn)	mg/L		0.00009	---	<0.030	<0.00020
Titanium (Ti)	mg/L		<0.0005	---	<0.00030	0.00047
Uranium (U)	mg/L	0.027	0.00128	---	0.00853	0.0102
Vanadium (V)	mg/L		0.00014	---	<0.0050	0.0001
Zinc (Zn)	mg/L	0.11	0.0011	---	<0.0050	0.0012
TOTAL METALS (ICP-MS)						
Aluminum (Al)	mg/L	0.16	0.0574	<0.020	0.02	0.781
Antimony (Sb)	mg/L	0.03	0.002	0.002	<0.20	0.001
Arsenic (As)	mg/L	0.05	0.02	0.04	0.04	0.04
Barium (Ba)	mg/L		0.0365	0.0104	0.0108	0.0138
Beryllium (Be)	mg/L		<0.00005	<0.0010	<0.0050	<0.0010
Bismuth (Bi)	mg/L		<0.00005	<0.00020	<0.00020	0.00026
Boron (B)	mg/L		0.03	<0.020	0.0203	<0.020
Cadmium (Cd)	mg/L	0.00015	0.00002	<0.00020	<0.000050	<0.00020
Calcium (Ca)	mg/L		99.8	45.8	44.2	45.1
Cesium	mg/L			---	---	
Chromium (Cr)	mg/L		<0.0002	<0.00080	<0.00080	<0.00080
Cobalt (Co)	mg/L	0.004	0.0105	0.00311	0.00349	0.00713
Copper (Cu)	mg/L	0.022	0.0033	0.0037	<0.010	0.0073
Iron (Fe)	mg/L		0.107	<0.010	0.014	1.28
Lead (Pb)	mg/L	0.001	0.00003	<0.00010	<0.00010	0.00022
Lithium (Li)	mg/L		0.0032	---	<0.010	
Magnesium (Mg)	mg/L		28.8	13.4	12.6	14.7
Manganese (Mn)	mg/L		0.00467	<0.0020	<0.00020	0.0097
Molybdenum (Mo)	mg/L	0.073	0.00409	0.0102	<0.030	0.00842
Nickel (Ni)	mg/L		<0.0005	0.00068	0.00095	0.00186
Potassium (K)	mg/L		12	---	<0.010	3.75
Rubidium	mg/L			3.8	3.38	
Selenium (Se)	mg/L	0.0035	<0.0005	<0.00040	<0.00040	<0.00040
Silver (Ag)	mg/L		<0.00001	<0.00040	<0.010	<0.00040
Sodium (Na)	mg/L		32.5	11.5	11.3	12.2
Strontium (Sr)	mg/L		0.16	0.0725	0.0717	0.0797
Thallium (Tl)	mg/L		<0.00005	<0.00010	<0.20	<0.00010
Tin (Sn)	mg/L		0.00013	<0.00040	<0.00040	<0.00040
Titanium (Ti)	mg/L		0.0014	<0.0050	<0.00060	0.015
Uranium (U)	mg/L	0.027	0.00118	0.0128	0.00903	0.012
Vanadium (V)	mg/L		0.0001	<0.00050	<0.00050	0.00087
Zinc (Zn)	mg/L	0.11	0.0019	<0.0040	<0.0040	<0.0040

Notes:

0.3 Indicates that the parameter occurs at a concentration in excess of the site specific water quality objectives.

ATTACHMENT 7.III.III

Quality Control – Groundwater Quality

PARAMETER	UNITS	GS-09-01 Field Blank	FM-10-01 Field Blank
Date		29-Aug-09	16-Aug-10
GENERAL PARAMETERS			
pH	pH units	5.95	5.87
Conductivity	uS/cm	<0.20	0.91
Alkalinity	mg/L as CaCO ₃	<5.0	< 5.0
Hardness ²	mg/L as CaCO ₃	<1.3	< 1.3
Bicarbonate (HCO ₃)	mg/L	<5.0	< 5.0
Carbonate (CO ₃)	mg/L	<5.0	< 5.0
Total Dissolved Solids (TDS)	mg/L	<5.0	< 1.0
ANIONS & NUTRIENTS			
Chloride (Cl)	mg/L	<0.50	< 0.50
Sulphate (SO ₄)	mg/L	<0.50	< 0.50
Fluoride (F)	mg/L	<0.050	< 0.050
Phosphorous (P)	mg/L	<0.020	< 0.020
Ammonia (NH ₃ +NH ₄)	as N mg/L	<0.050	< 0.050
Nitrite (NO ₂)	as N mg/L	<0.050	< 0.050
Nitrate (NO ₃)	as N mg/L	<0.050	< 0.050
DISSOLVED METALS (ICP-MS)			
Aluminum (Al)	mg/L	<0.0050	< 0.0050
Antimony (Sb)	mg/L	<0.00040	< 0.00040
Arsenic (As)	mg/L	<0.00040	< 0.00040
Barium (Ba)	mg/L	<0.00010	< 0.00010
Beryllium (Be)	mg/L	<0.00050	< 0.0050
Bismuth (Bi)	mg/L	<0.000050	< 0.000050
Boron (B)	mg/L	<0.0020	< 0.0020
Cadmium (Cd)	mg/L	<0.000050	< 0.000050
Calcium (Ca)	mg/L	<0.050	< 0.050
Chromium (Cr)	mg/L	<0.00040	< 0.0050
Cobalt (Co)	mg/L	<0.00010	< 0.010
Copper (Cu)	mg/L	<0.00060	< 0.010
Lead (Pb)	mg/L	<0.00010	< 0.0001
Lithium (Li)	mg/L	<0.0030	< 0.01
Magnesium (Mg)	mg/L	<0.050	< 0.050
Manganese (Mn)	mg/L	<0.00020	< 0.0020
Molybdenum (Mo)	mg/L	<0.00010	0.000
Nickel (Ni)	mg/L	0.00016	< 0.050
Potassium (K)	mg/L	<0.050	< 0.050
Selenium (Se)	mg/L	<0.00040	< 0.00040
Silver (Ag)	mg/L	<0.00010	< 0.010
Sodium (Na)	mg/L	<0.20	< 0.20
Strontium (Sr)	mg/L	<0.00010	< 0.0050
Thallium (Tl)	mg/L	<0.000050	< 0.20
Tin (Sn)	mg/L	<0.00020	< 0.030
Titanium (Ti)	mg/L	<0.00030	< 0.00030
Titanium (Ti)	mg/L	---	---
Vanadium (V)	mg/L	---	---
Zinc (Zn)	mg/L	---	---
TOTAL METALS (ICP-MS)			
Aluminum (Al)	mg/L	<0.020	< 0.010
Antimony (Sb)	mg/L	<0.00040	< 0.00040
Arsenic (As)	mg/L	<0.00040	< 0.00040
Barium (Ba)	mg/L	<0.00020	< 0.00020
Beryllium (Be)	mg/L	<0.0010	< 0.0010
Bismuth (Bi)	mg/L	<0.00020	< 0.20
Boron (B)	mg/L	<0.020	< 0.0040
Cadmium (Cd)	mg/L	<0.00020	< 0.000050
Calcium (Ca)	mg/L	<0.50	< 0.50
Cesium	mg/L	---	---
Chromium (Cr)	mg/L	<0.00080	< 0.00080
Cobalt (Co)	mg/L	<0.00020	< 0.010
Copper (Cu)	mg/L	<0.0010	< 0.010
Iron (Fe)	mg/L	<0.010	< 0.010
Lead (Pb)	mg/L	<0.00010	< 0.00010
Lithium (Li)	mg/L	---	< 0.0060
Magnesium (Mg)	mg/L	<0.10	< 0.10
Manganese (Mn)	mg/L	<0.0020	< 0.0020
Molybdenum (Mo)	mg/L	<0.00010	< 0.030
Nickel (Ni)	mg/L	<0.00020	< 0.050
Potassium (K)	mg/L	<0.10	< 0.05
Rubidium	mg/L	---	---
Selenium (Se)	mg/L	<0.00040	< 0.00040
Silver (Ag)	mg/L	<0.00040	< 0.010
Sodium (Na)	mg/L	<1.0	< 1.0
Strontium (Sr)	mg/L	<0.00020	< 0.00020
Thallium (Tl)	mg/L	<0.00010	< 0.00010
Tin (Sn)	mg/L	<0.00040	< 0.00040
Titanium (Ti)	mg/L	<0.0050	< 0.00060
Uranium (U)	mg/L	<0.00010	< 0.00010
Vanadium (V)	mg/L	<0.00050	< 0.0050
Zinc (Zn)	mg/L	<0.0040	< 0.0040

Attachment 7.III.III-2
Quality Control - Groundwater Quality

PARAMETER	UNITS	03-282	03-282 (Replicate)	Relative Percent Difference	03-281	GS-09-02 (03-281 - Replicate)	Relative Percent Difference
Date		10-Jul-04	10-Jul-04		30-Aug-09	30-Aug-09	
GENERAL PARAMETERS							
pH	pH units	11.1	11.1	0	10.07	10.01	1
Conductivity	uS/cm	290	307	6	493	500	1
Alkalinity	mg/L as CaCO ₃	91	95	4	126	150	17
Hardness ²	mg/L as CaCO ₃	87	90	3	35.8	38.8	8
Bicarbonate (HCO ₃)	mg/L	<5	<5		53	77.3	37
Carbonate (CO ₃)	mg/L	24	24	0	49.3	51.9	5
Total Dissolved Solids (TDS)	mg/L	147	149	1	324	315	3
ANIONS & NUTRIENTS							
Chloride (Cl)	mg/L	2	1	67	1.15	1.26	9
Sulphate (SO ₄)	mg/L	35.8	35.2	2	114	114	0
Fluoride (F)	mg/L	---	---		1.97	1.98	1
Phosphorous (P)	mg/L	0.012	0.01	18	0.368	0.373	1
Ammonia (NH ₃ +NH ₄)	as N mg/L	0.036	0.032	12	0.07	0.071	1
Nitrite (NO ₂)	as N mg/L	<0.002	0.002		<0.050	<0.050	
Nitrate (NO ₃)	as N mg/L	0.021	0.022	5	<0.050	<0.050	
DISSOLVED METALS (ICP-MS)							
Aluminum (Al)	mg/L	---	---		0.185	0.185	0
Antimony (Sb)	mg/L	---	---		0.00237	0.00238	0
Arsenic (As)	mg/L	---	---		0.321	0.323	1
Barium (Ba)	mg/L	---	---		0.014	0.0151	8
Beryllium (Be)	mg/L	---	---		<0.00050	<0.00050	
Bismuth (Bi)	mg/L	---	---		0.000394	0.000394	0
Boron (B)	mg/L	---	---		0.1	0.109	9
Cadmium (Cd)	mg/L	---	---		0.00018	0.000178	1
Calcium (Ca)	mg/L	---	---		12.8	13.3	C
Chromium (Cr)	mg/L	---	---		0.00221	0.00221	0
Cobalt (Co)	mg/L	---	---		0.00035	0.00035	0
Copper (Cu)	mg/L	---	---		0.00444	0.00461	4
Lead (Pb)	mg/L	---	---		<0.00010	<0.00010	
Lithium (Li)	mg/L	---	---		0.015	0.0157	5
Magnesium (Mg)	mg/L	---	---		0.91	0.889	2
Manganese (Mn)	mg/L	---	---		0.0032	0.0035	9
Molybdenum (Mo)	mg/L	---	---		0.033	0.0378	14
Nickel (Ni)	mg/L	---	---		0.00144	0.00144	0
Potassium (K)	mg/L	---	---		8.31	8.42	1
Selenium (Se)	mg/L	---	---		<0.00040	<0.00040	
Silver (Ag)	mg/L	---	---		<0.00010	<0.00010	
Sodium (Na)	mg/L	---	---		87.9	90.9	3
Strontium (Sr)	mg/L	---	---		0.09	0.0982	9
Thallium (Tl)	mg/L	---	---		<0.000050	<0.000050	
Tin (Sn)	mg/L	---	---		0.00036	0.00038	5
Titanium (Ti)	mg/L	---	---		0.00309	0.00304	2
Uranium (U)	mg/L	---	---		0.00273	0.00271	1
Vanadium (V)	mg/L	---	---		0.00275	0.00278	1
Zinc (Zn)	mg/L	---	---		0.0021	0.0023	9
DISSOLVED METALS (ICP-OES)							
Aluminum (Al)	mg/L	---	---		<0.20	<0.20	
Antimony (Sb)	mg/L	---	---		<0.20	<0.20	
Arsenic (As)	mg/L	---	---		0.33	0.36	9
Barium (Ba)	mg/L	---	---		0.0153	0.018	16
Beryllium (Be)	mg/L	---	---		<0.0050	<0.0050	
Bismuth (Bi)	mg/L	---	---		<0.20	<0.20	
Boron (B)	mg/L	---	---		0.112	0.13	15
Cadmium (Cd)	mg/L	---	---		<0.010	<0.010	
Calcium (Ca)	mg/L	---	---		13.3	13.9	4
Chromium (Cr)	mg/L	---	---		<0.0050	<0.0050	
Cobalt (Co)	mg/L	---	---		<0.010	<0.010	
Copper (Cu)	mg/L	---	---		<0.010	<0.010	
Iron (Fe)	mg/L	---	---		0.259	0.307	17
Lead (Pb)	mg/L	---	---		<0.050	<0.050	
Lithium (Li)	mg/L	---	---		0.0159	0.016	1
Magnesium (Mg)	mg/L	---	---		0.91	1	9
Manganese (Mn)	mg/L	---	---		0.00371	0.00375	1
Molybdenum (Mo)	mg/L	---	---		0.0373	0.038	2
Nickel (Ni)	mg/L	---	---		<0.050	<0.050	
Potassium (K)	mg/L	---	---		8.7	9.21	6
Selenium (Se)	mg/L	---	---		<0.20	<0.20	
Silicon (Si)	mg/L	---	---		4.41	4.82	9
Silver (Ag)	mg/L	---	---		<0.010	<0.010	
Sodium (Na)	mg/L	---	---		87.9	90.9	3
Strontium (Sr)	mg/L	---	---		0.109	0.0996	9
Sulfur (S)	mg/L	---	---		34.6	37.4	8
Thallium (Tl)	mg/L	---	---		<0.20	<0.20	
Tin (Sn)	mg/L	---	---		<0.030	<0.030	
Titanium (Ti)	mg/L	---	---		<0.010	<0.010	
Vanadium (V)	mg/L	---	---		<0.0050	<0.0050	
Zinc (Zn)	mg/L	---	---		<0.0050	<0.0050	

Attachment 7.III.III-2
Quality Control - Groundwater Quality

PARAMETER	UNITS	03-282	03-282 (Replicate)	Relative Percent Difference	03-281	GS-09-02 (03-281 - Replicate)	Relative Percent Difference
Date		10-Jul-04	10-Jul-04		30-Aug-09	30-Aug-09	
TOTAL METALS (ICP-MS)							
Aluminum (Al)	mg/L	0.01	0.01	0	1.88	1.84	2
Antimony (Sb)	mg/L	0.0031	0.0022	34	0.00977	0.0094	4
Arsenic (As)	mg/L	0.0792	0.0778	2	0.801	0.771	4
Barium (Ba)	mg/L	0.0438	0.0451	3	0.088	0.088	0
Beryllium (Be)	mg/L	<0.0005	<0.0005		<0.0010	<0.0010	
Bismuth (Bi)	mg/L	<0.0005	<0.0005		0.0189	0.0181	4
Boron (B)	mg/L	0.037	0.036	3	0.13	0.13	0
Cadmium (Cd)	mg/L	<0.0001	<0.0001		0.00106	0.00105	1
Calcium (Ca)	mg/L	33.3	34.6	4	41.2	41.1	0
Cesium	mg/L	0.0001	0.0001	0	---	---	
Chromium (Cr)	mg/L	0.0091	0.0086	6	0.0245	0.0245	0
Cobalt (Co)	mg/L	0.0014	0.0007	67	0.00801	0.00778	3
Copper (Cu)	mg/L	0.0048	0.0018	91	0.0234	0.0237	1
Iron (Fe)	mg/L	0.019	0.035	59	---	---	
Lead (Pb)	mg/L	0.0001	0.0001	0	0.00383	0.00388	1
Lithium (Li)	mg/L	0.0069	0.007	1	0.0149	0.0142	5
Magnesium (Mg)	mg/L	0.9	0.9	0	2.31	2.25	3
Manganese (Mn)	mg/L	0.003	0.003	0	0.129	0.125	3
Molybdenum (Mo)	mg/L	0.0341	0.0246	32	0.0394	0.0374	5
Nickel (Ni)	mg/L	0.0006	0.0002	100	0.0103	0.00992	4
Potassium (K)	mg/L	2.8	2.6	7	8.84	9.13	3
Rubidium	mg/L	<0.05	<0.05		---	---	
Selenium (Se)	mg/L	<0.0004	<0.0004		0.0005	0.0005	0
Silver (Ag)	mg/L	<0.0002	<0.0002		0.00073	0.00122	50
Sodium (Na)	mg/L	18	18	0	87.7	87.2	1
Strontium (Sr)	mg/L	0.189	0.191	1	0.128	0.129	1
Thallium (Tl)	mg/L	<0.00005	<0.00005		<0.00010	<0.00010	
Tin (Sn)	mg/L	0.0002	<0.0002		0.00204	<0.00202	1
Titanium (Ti)	mg/L	0.0003	0.0004	29	0.0846	0.0821	3
Uranium (U)	mg/L	0.0003	0.0005	50	0.00365	0.00365	0
Vanadium (V)	mg/L	0.0021	0.002	5	0.00753	0.00765	2
Zinc (Zn)	mg/L	0.007	0.007	0	0.0552	0.0537	3
TOTAL METALS (ICP-OES)							
Aluminum (Al)	mg/L	---	---		1.88	1.89	1
Antimony (Sb)	mg/L	---	---		<0.20	<0.20	
Arsenic (As)	mg/L	---	---		0.86	0.85	1
Barium (Ba)	mg/L	---	---		0.0971	0.0976	1
Beryllium (Be)	mg/L	---	---		<0.0050	<0.0050	
Bismuth (Bi)	mg/L	---	---		<0.20	<0.20	
Boron (B)	mg/L	---	---		<0.10	<0.10	
Cadmium (Cd)	mg/L	---	---		<0.010	<0.010	
Calcium (Ca)	mg/L	---	---		42.4	43.1	2
Chromium (Cr)	mg/L	---	---		0.026	0.0261	0
Cobalt (Co)	mg/L	---	---		<0.010	<0.010	
Copper (Cu)	mg/L	---	---		0.028	0.029	4
Iron (Fe)	mg/L	---	---		18.4	18	2
Lead (Pb)	mg/L	---	---		<0.050	<0.050	
Lithium (Li)	mg/L	---	---		0.016	0.016	0
Magnesium (Mg)	mg/L	---	---		2.43	2.47	2
Manganese (Mn)	mg/L	---	---		0.132	0.131	1
Molybdenum (Mo)	mg/L	---	---		0.048	0.047	2
Nickel (Ni)	mg/L	---	---		<0.050	<0.050	
Potassium (K)	mg/L	---	---		9.18	9.17	0
Selenium (Se)	mg/L	---	---		<0.20	<0.20	
Silicon (Si)	mg/L	---	---		12.1	12.3	2
Silver (Ag)	mg/L	---	---		<0.010	<0.010	
Sodium (Na)	mg/L	---	---		---	---	
Strontium (Sr)	mg/L	---	---		0.137	0.136	1
Sulfur (S)	mg/L	---	---		40.7	41.6	2
Thallium (Tl)	mg/L	---	---		<0.20	<0.20	
Tin (Sn)	mg/L	---	---		<0.030	<0.030	
Titanium (Ti)	mg/L	---	---		0.086	0.085	1
Vanadium (V)	mg/L	---	---		0.008	0.0078	3
Zinc (Zn)	mg/L	---	---		0.0589	0.0586	1

0.3

Indicates an RPD greater than 20%.