January 2014

REPORT ON

Rock Storage Facility Seepage - Meadowbank Gold Mine, Nunavut

Submitted to:
Mr. Kevin Buck
Environmental Superintendent
Agnico-Eagle Mines Limited
Meadowbank Division
PO Box 540
Baker Lake, Nunavut X0C 0A0

REPORT

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1.0 INTRODUCTION

On November 8, 2013, Agnico-Eagle Mines Limited (AEM) received an inspector's direction from the Aboriginal Affairs and Northern Development of Canada (AANDC) related to the seepage of water from the Portage Rock Storage Facility (RSF) into Lake NP-2. According to the received direction, the RSF seepage contravenes AEM's type A water license #2AM-MEA0815 (water license). The inspector requested that AEM:

- Conduct an investigation about the release of waste from ST-16 sump location to Lake NP-2, which includes determining the source of the contaminated water in ST-16 sump;
- Conduct an investigation, in consultation with an independent firm, about possible failure of the Till plug designed to prevent waste from migrating out of ST-16 sump into Lake NP-2;
- Develop a plan in consultations with an independent engineering firm about:
  - Corrective measures that will be taken to immediately stop the release of waste;
  - Long term corrective measures that will be taken to secure waste in the future;
  - Counteraction and/or remediation of the adverse impacts of the prior releases.

On November 15, 2013, AEM requested that Golder Associates Ltd. (Golder) prepare an assessment report regarding the RSF based on the above. The assessment report includes findings and immediate actions, as well as presenting recommendations about the immediate- and long-term corrective actions.

2.0 BACKGROUND

This section presents the basic background information for the seepage through the RSF. The first subsection describes the general configuration of the concerned area and the second describes the basis of the assessment.

2.1 TSF and RSF Overview

Figure 1 presents the general configuration of the Tailings Storage Facility (TSF) and the RSF. The RSF is adjacent to the North Cell of the TSF and is used to store potentially acid generating (PAG) and non-acid generating (non-AG) waste rock. The North Cell of the TSF is used to store tailings and reclaim water for milling processes.

Rockfill roads RF1 and RF2 are located along the north-east side of the TSF and are perimeter structures that separate the RSF from the North Cell. The East and West diversion ditches are located around the northern area of the North Cell of the TSF to keep surface water from reaching the RSF and the TSF. Lake NP-2 and NP-1 are located north and east, respectively, of the RSF.

According to AEM, the access road between the RSF and Lake NP-2 was initially constructed to provide a separation between the RSF and Lake NP-2. It was also used to construct and service the diversion ditches (East and West) in 2012; this road is constructed with non-AG rockfill. The East Ditch flows through Lake NP-2 and connects to Lake NP-1. This ditch controls the water levels in these lakes such that the water level does not rise and overflow into the active mine area (i.e., the RSF).

2.2 Basis of the Assessment

During the AANDC Water License Inspection on July 29 and 30, 2013, AEM and the AANDC inspector observed red coloured seepage (suggesting the presence of iron precipitate) flowing from the northwest side of the RSF through the road perimeter into Lake NP-2, near monitoring station ST-16. Sample location ST-16 is a known area of seepage and is in a natural low depression area that serves as a sump.

AEM and the inspector took split water samples from Lake NP-2 and station ST-16. The chemical analyses from this sampling showed that these samples had elevated levels of metals (copper and nickel) when compared to samples collected at ST-16 from 2010 to July 2013, including a sample collected on July 11, 2013. Additional samples collected in August and September 2013 from ST-16 showed elevated concentration of copper, nickel and presence of cyanide. Additional sampling in Lake NP-2 showed that the same parameters were present in this lake at lower concentrations than ST-16.

When the red-coloured seepage was observed, AEM's immediate action plan (starting on July 27) consisted of dewatering the water from the sump area at the ST-16 water monitoring station. The sump area at sampling station ST-16 was completely dewatered by August 4, 2013. This action stopped the seepage to Lake NP-2 and confirmed that seepage from the RSF was visible at base of the RSF near the ST-16 location. Seepage water from the RSF was then redirected to the TSF North Cell by pumper trucks. AEM also designed and constructed a till plug on the upstream slope of the RSF perimeter road which, combined with the pumping program keeping a low water level within the sump, prevent the seepage from reaching Lake NP-2. Construction of till plug was performed between August 26 and September 1, 2013. Pumping of the sump continued on a regular basis from July 29 until approximately mid-October when the seepage water froze.

2.3 TSF and RSF Design Bases

The designs of the TSF and RSF were reviewed. The design of the TSF requires that a tailings beach is required against all perimeter structures of the TSF to reduce seepage from the TSF. In addition, the reclaim pond is to be operated towards the centre of the TSF North Cell to reduce seepage flow from the TSF (AEM 2009; Golder 2008b).

The rockfill roads of the TSF, RF1 and RF2, are designed as unlined rockfill roads for use as pipe berms for tailings deposition. The rockfill roads are designed for tailings containment and not to limit seepage. The design is based on the expectation that the seepage from the TSF to the RSF will be limited by the deposition of tailings adjacent to the rockfill faces, the operation of the Reclaim Pond toward the centre of the facility, and the freezing of tailings in the post-closure period (Golder 2011). The design recognizes the possibility of water moving from the TSF to the RSF once the pond reaches a certain elevation. It also notes, if necessary, the need to establish a system of contact water ditches and sumps to surround the RSF to capture and allow the monitoring of surface runoff and seepage from the RSF and direct it to suitable storage/treatment facilities (Golder 2011).

The RSF is expected to freeze within two years of placement, thereby reducing the risk of acid drainage and assisting in containing the seepage of water (Golder 2011). The RSF is to be capped with an insulating layer of non-AG rock.

3.0 REVIEW OF FACTUAL INFORMATION

Golder reviewed the available information to assess the current conditions and the potential sources of the seepage.

3.1 TSF and RSF Configuration

Prior to mine development, a watercourse ran from Lake NP-2 to the northwest arm of the Second Portage Lake where the TSF is now located as shown in Figure 1.

The water surface in Lake NP-2 is at El. 141.2 m, the base of the RSF on its north side (near ST-16) is at approximately El. 142 m, and the tailings pond water level was approximately between El. 145.6 m and 146.1 m from mid-July to mid-October 2013. This information confirms that the hydraulic gradient flows from the TSF to the sump at ST-16 upstream from Lake NP-2; this gradient is the reverse to that which existed before mine development started. This suggests the presence of saturated rockfill in a thawed condition at the bottom of the RSF having its water surface at El. 142 m; this corresponds to the seepage level at the exit of the RSF on its north side.

The review of the TSF operating configuration in September 2013 shows that tailings water was pounding directly against RF1 and RF2. Further, there was no tailings beach against RF2 and less than half of RF1 had a tailings beach. By mid-October, AEM confirms that the tailings beach along RF1 was covering 90% of the structure and that no beach along RF2 was yet in place.

It is also noted that the water management system consisting of diversion ditches surrounding the RSF is not completed.Since the water catchment basin of the TSF and RSF area directes the water towards the North and South Cells of the TSF and the only seepage observed out of the area is near the natural sump at sampling station ST-16, AEM considered that the provision of a collection system was not necessary. Rather, AEM used an observational approach at the natural sump and sampling station ST-16 to ensure that the water analyses results are appropriate.

3.2 Review of Monitoring and Sample Analyses

All the laboratory testing results provided by AEM to Golder, summarized below, are presented in Appendix A.

From July 30 to August 27, 2013, various water samples were taken by AEM and the AANDC inspector at sampling station ST-16 and at various sampling station on Lake NP-2 and NP-1. The locations of these samples are shown in Figure 3.

Starting August 28, 2013, AEM implemented a short-term monitoring program that included daily monitoring of weak acid dissociable cyanide (CN WAD) at the seepage area ST-16 and at NP-2 South. This short-term cyanide program used the non-accredited onsite assay lab. The program also includes once every-two-weeks monitoring for total and dissolved metals, general chemistry as well as total and free cyanide at sampling station ST-16, NP-2 South, NP-2 East and NP-2 West. These analyses were performed by Multi-Lab, an accredited laboratory. The once every-two-weeks monitoring was temporarily stopped in October due to the frozen conditions. A monthly monitoring station has been set for the winter on Lake NP-2; refer to Figure 3. The locations of the sampling areas as part of the short-term monitoring program are shown in Figure 4.

AEM provided Golder with the results of the sample analyses described above. Historical results at station ST-16 and the results from sampling station ST-21 (located inside the TSF) were also made available for comparison purposes. Multi Lab provided comments to AEM that it is difficult to compare the results from Multi Lab and those from AEM's onsite laboratory because the onsite free cyanide analysis is based on a qualitative method rather than a distillation standardized method used for the total and WAD cyanide.

The results show that the concentrations of copper, nickel, ammonia, and cyanide exceed the CCME criteria for Protection of Aquatic Life. The result of the trout toxicity test, sampled on August 28, show that the concentration was not lethal. An additional toxicity sample was taken on Dec 9, 2013 and the result was also not lethal for trout. A sample was analysed for copper in Lake NP-1 on August 21, 2013 and showed a low concentration. The concentration of metals observed from July 30 to August 27, 2013 at sampling station ST-16 are higher than the historical results from 100 to 1,000 times. These results are similar to the results from the samples taken at ST-21 inside the TSF, except for the concentration of iron which is much higher at ST-16 than at ST-21. These results, coupled with the presence of cyanide at ST-16, indicate that the origin of the seepage water is from the TSF.

The results from the short-term monitoring program show that the concentrations of metals and cyanide at sampling station ST-16 and in Lake NP-2 decreased from August to October 2013. This is an indication that the immediate actions taken by AEM to pump and control the RSF seepage were effective in decreasing the concentrations of metals and cyanide.

3.3 Thermistor Data

Golder reviewed the thermistor data in the area of the RSF. The location of these thermistors and their temperature versus depth profiles during 2012 and 2013 are shown in Figure 5. Figure 5 was developed using the TSF - Instrumentation Review document provided by AEM and is presented in Appendix C. The following points were developed during the review of the thermistor data:

- The thermistor inside the North Cell of the TSF (T-90-2) shows that the tailings are below 0°C near Saddle Dam 1. This thermal condition, coupled with the expectation that the tailings are saturated, indicates that the tailings are frozen in this area.
- The thermistor inside the RSF (RSF-1) indicates that the waste rock pile is below 0°C at this location. This thermistor is located in an area where the natural ground surface is above El. 142 m.
- RF2 (T122-1) indicates that rockfill road RF2 is below 0°C in this area.
- The RF1-3 thermistor is installed along the upstream slope in a PVC casing partially covered with tailings. RF1-3 indicates that the tailings are thawed from their surface at approximately El. 145 m down to approximately El. 144.2 m. Below El. 144.2 m, the temperature is below 0°C; as the tailings are expected to be saturated in this location, it is inferred that the tailings are frozen below El. 144.2 m.
- RF1-1 (T121-1) indicates that the rockfill was below 0°C throughout 2013 at this location. Note that the natural ground surface is relatively shallow in this area.
- RF1-2 is located close to the former watercourse (like RF1-1) but its natural ground surface is at a lower level and indicates that the rockfill is thawed at the tailings water level (El. 145.7 m) and below 0°C below El. 143 m. As the tailings are expected to be saturated, the tailings are expected to be frozen below El. 143 m.

These observations indicate that some parts of the rockfill road RF1 are not frozen due to thermal conditions (i.e., temperatures above 0°C) and the lack of saturated rockfill.

From November 8 to 11, 2013, AEM installed four additional thermistors in the RSF (RSF3 to RSF6) to monitor the temperatures in the structure and in the vicinity of the former lake and water course between Lake NP-2 and the second Portage arm (North Cell). The locations of these instruments are shown in Figure 5. The available results are limited for interpretation as the instruments are still showing a cooling trend but these data will be helpful to follow the freezing of the RSF along the former water course.

The following are noted based on a review of the data to December 6, 2013 for thermistors RSF3 to RSF6, inclusive:

- Thermistor RSF3 shows that the rockfill is at temperatures ranging from 0 to -5°C.
- Thermistor RSF4 shows temperatures in the rockfill from 2 to – 10°C.
- Thermistor RSF5 shows temperatures in the rockfill from 0 to -5°C.
- Thermistor RSF6 shows that the temperature of the rockfill ranges from -2 to -9°C.

Thermistors RSF3 to RSF6, inclusive, show that the thermistors continue to adjust to the ground temperature conditions; this is expected due to their recent installation dates. Continued monitoring of these thermistors is required for future interpretation.

4.0 SUMMARY OF AEM'S MITIGATION STRATEGY

Golder reviewed AEM's preliminary report on the seepage of water from the waste rock storage facility (included in Appendix B). This report contains AEM's findings and actions for the RSF. From the review of this document and from additional information provided by AEM, the following items are noted:

- AEM established a short-term monitoring program, as presented in Section 3.2, and will keep sampling one location during the winter;
- AEM established a pumping program (by pumper truck) to keep the water level low in the sump at sampling station ST-16 and to pump the seepage back into the TSF;
- AEM constructed a till plug to limit the seepage from the RSF to Lake NP-2. AEM will increase the pumping of the seepage water into the sump. The construction summary report of this structure was provided to Golder and is presented in Appendix D. ;
- AEM modified the tailings deposition plan to promote the development of tailings beaches against RF1 and RF2 and to ensure that the reclaim pond is operated away from the rockfill roads. AEM changed the tailings discharge point on September 2, 2013 to promote the development of a tailings beach against RF1 where tailings water was pounding directly against the structure. A new deposition plan was completed by AEM on November 17, 2013 and is presented in Appendix E.
- AEM installed four additional thermistors in the RSF to monitor ground temperatures in this area.
- AEM estimated the 2014 freshet water quantities for the freshet season emergency plan preparedness.

5.0 ASSESSMENT ON RSF SEEPAGE FINDINGS AND AEM'S MITIGATION PLAN

Golder considers that the long-term design intent of the TSF and the RSF can still be met provided that the design is executed in the field. The requirements include providing tailings beaches along any of the TSF perimeter structures, including the rockfill roads, and operating the reclaim pond toward the centre of the facility, namely, away from dikes and rockfill roads. It is to be noted that the concept envisaged the possibility of seepage. This is the reason why a contact water collection system was planned as a contingency measure.

TSF and RSF Configuration

The review of the TSF operating configuration indicates that tailings water was ponding directly against RF1 and RF2; these are perimeter structures of the TSF. The formation and maintenance of tailings beaches are required at all perimeter structures of the TSF to limit seepage from the facility and to maintain the reclaim pond in a centralized location. The updated deposition plan prepared, and currently being used, by AEM focusses on beach development at RF1 and RF2.

The water management system, consisting of diversion ditches surrounding the RSF has not been required to date. AEM stated that this system has not yet been constructed due to the ability of AEM to manage the seepage appropriately historically. The pumping activities and the construction of the till plug are considered to be effective seepage control measures.

Monitoring and Sample Analysis

Golder agrees with AEM that the cause of the high metals and cyanide concentration of the RSF seepage near ST-16 is due to the ingress of process water from the TSF. This suggests the presence of saturated and thawed rockfill linking the TSF to the RSF seepage near sampling station ST-16.

From the review of the data at the sampling station ST-16 and within Lake NP-2, where the metals and cyanide concentration decreased from August 4 to mid-October, it appears that the till plug, combined with the pumping program to maintain a low water level within the sump at sampling station ST-16, were appropriate measures to prevent further seepage from reaching Lake NP-2.

Till Plug

The till plug is constructed of low permeability till material placed on a granular filter layer against the rockfill road. This structure is considered to be physically stable. In terms of seepage control, the performance of the till plug and the associated pumping keeping a low water level in the sump at the sampling station ST-16 appears to be effective in managing seepage to Lake NP-2.

Thermistor Data

From the thermistor data, it is noted that the tailings near SD1 are frozen. Freeze-back of the tailings reduces the seepage of water from the TSF. It is expected that the tailings adjacent to RF1 and RF2, following the formation of the tailing beaches in these locations, would also freeze, thereby limiting seepage through the rockfill roads to the RSF.

The flow of tailings water through the RSF is complex and cannot be readily tracked with thermistors or others instruments. The recently-installed thermistors in the RSF will allow monitoring of the ground temperatures. This information will further enable overall monitoring of thermal and seepage conditions in and around the RSF.

2014 Freshet Water Quantity

AEM has estimated the 2014 freshet water quantity in preparing the freshet season emergency plan. Golder did not review this work. This evaluation should provide suitable information to help plan for the 2014 freshet season. This may include determining if a pumper truck, the sump, and the till plug at ST-16 will be adequate during the 2014 freshet.

6.0 RECOMMENDATIONS

Based on review summarized above, Golder recommends the following:

1) AEM should continue to develop and maintain tailings beaches adjacent to RF1 and RF2 and to operate the Reclaim Pond towards the centre of the TSF. These are the key recommendations.

2) AEM should consider the installation of additional water management infrastructure which could take the form of a permanent collection and pumping system at the sampling station ST-16 current sump. Also, consideration should be given for contact water ditches and sumps in the surrounding areas of the RSF if additional seepages of contaminated water are observed in the future.

3) The seepage at station ST-16 should continue to be collected and redirected to the TSF and monitored (location, quantity, quality). Continued monitoring is strongly recommended during the winter for seepage water quantity monitoring and possible development of an ice plug in the RSF. The area at ST-16 should be kept clean of snow to allow visual observation and to ensure that water at ST-16 does not overflow over the till plug into Lake NP-2.

4) Regular inspections all around the RSF should be performed, particularly during freshet, to ensure that runoff or any observed seepage is controlled and monitored prior to being released into the environment if the analyses results meet the requirement.

5) AEM should continue to monitor the tailings and waste rock freeze back following the Thermistor Monitoring Plan in accordance with Part 1, Item 11 of the Type-A water license.

6) AEM should provide the results of the 2014 monitoring to Golder for review and comment.

7.0 REPORT CLOSURE

We trust that this report satisfies your current requirements. Please contact the undersigned should you have any questions.

GOLDER ASSOCIÉS LTÉE

Yves Boulianne, P.Eng (NU)
Associate, Project Manager

Annie Beaulieu, Eng. (Qc)
Associate, Project Director

Reviewed by:

FOR

Paul Bedell, M.E.Sc., P. Eng.(NWT/NU)
Principal, Senior Geotechnical Engineer

FLB/YB/AB/PMB/

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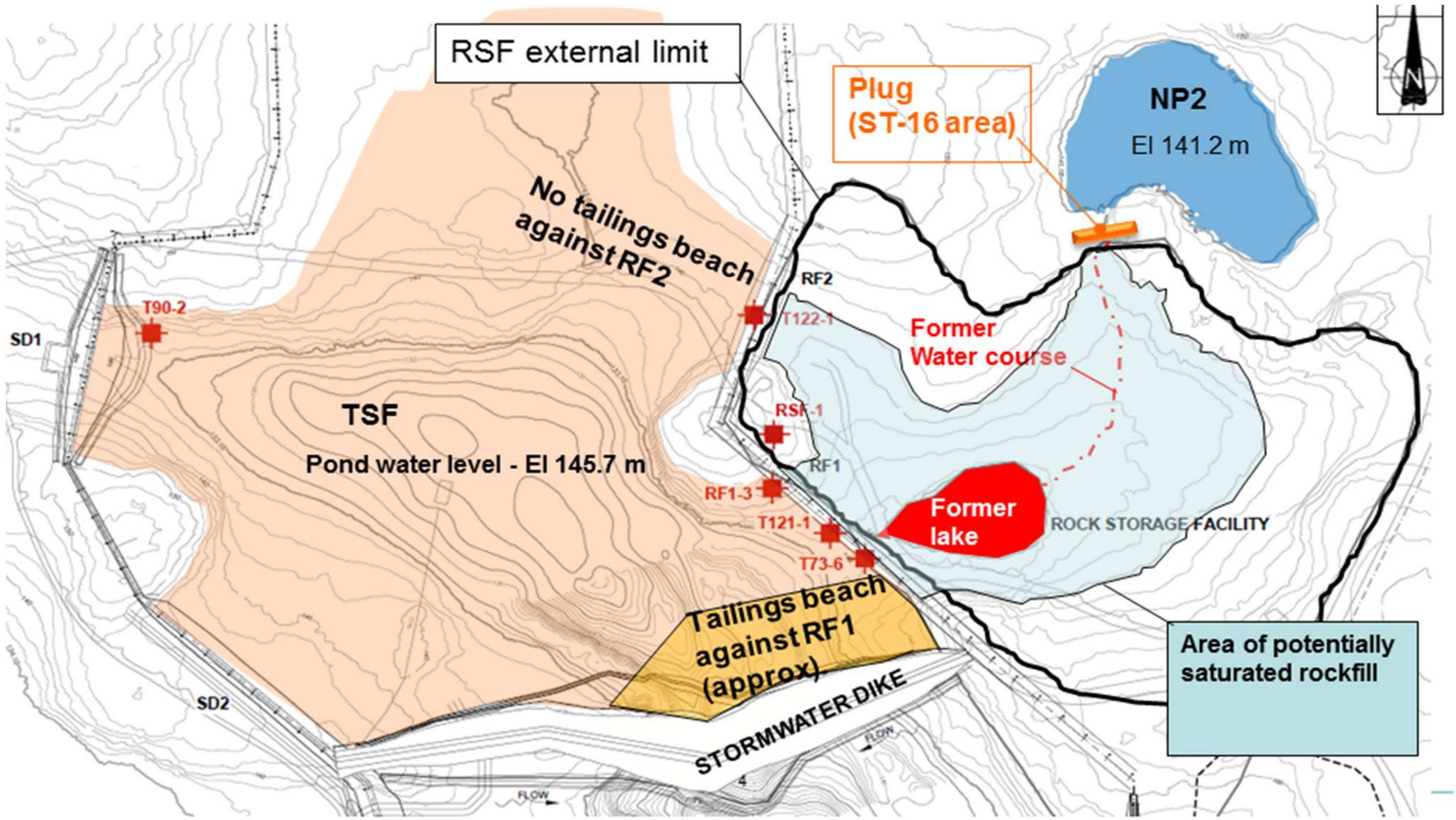
GENERAL CONFIGURATION OF THE TSF AND RSF FACILITIES



	Date : December 2013 Project : 13-1221-0115	AGNICO-EAGLE MINES MEADOWBANK DIVISION	FIGURE 1

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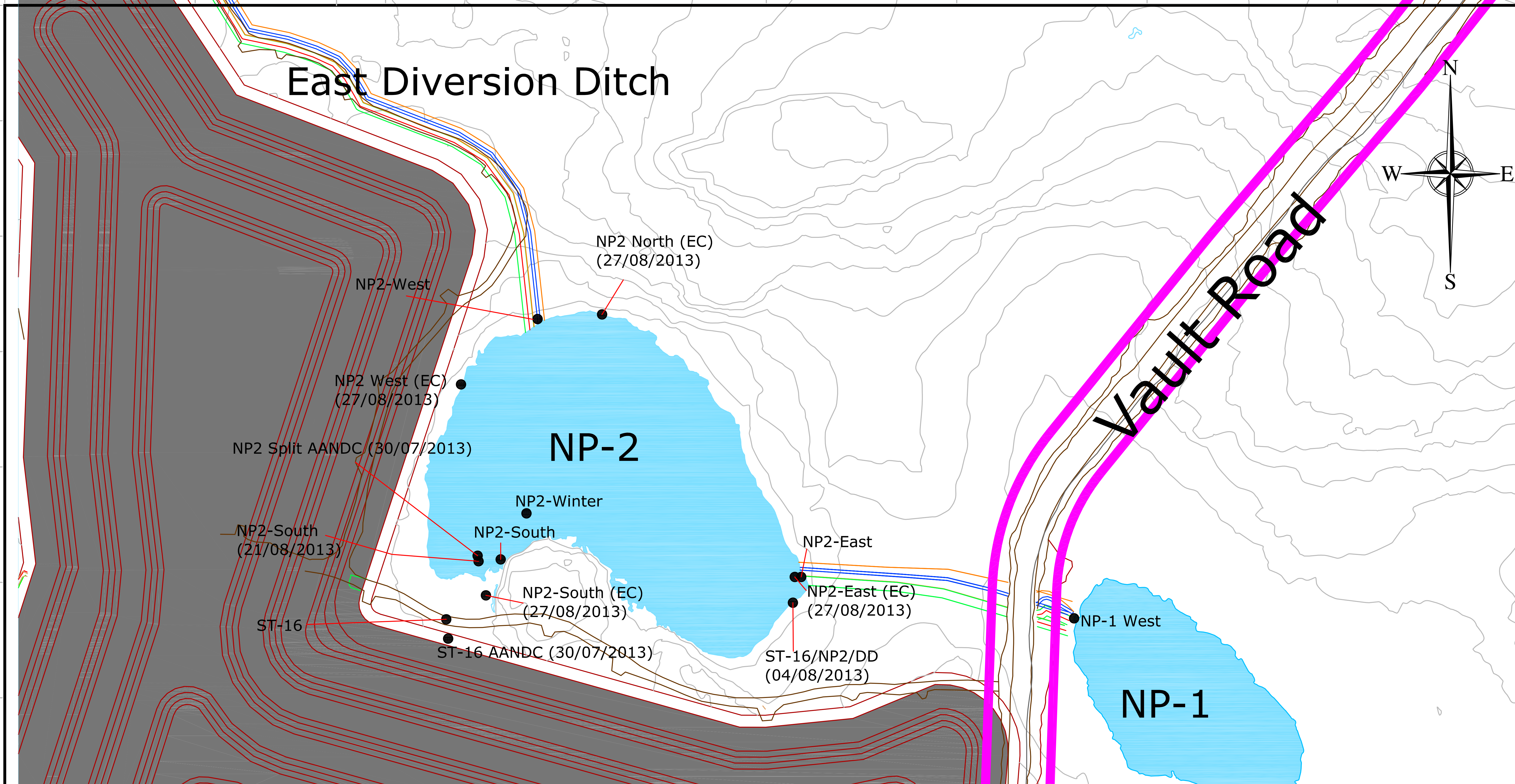

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REVISIONS

AGNICO EAGLE

DESSINÉ PAR / DRAWN BY	Marie–Pier Marcil	DATE	30–08–2013
VÉRIFIÉ PAR / CHECKED BY			
APPROUVÉ PAR / APPROVED BY			
No. PROJET / PROJECT NO.			
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TITRE / TITLE
AGNICO EAGLE – Meadowbank Division

2013 Monitoring Station Seep + NP2 Lake
Sampling Location from July 30 to August 27, 2013

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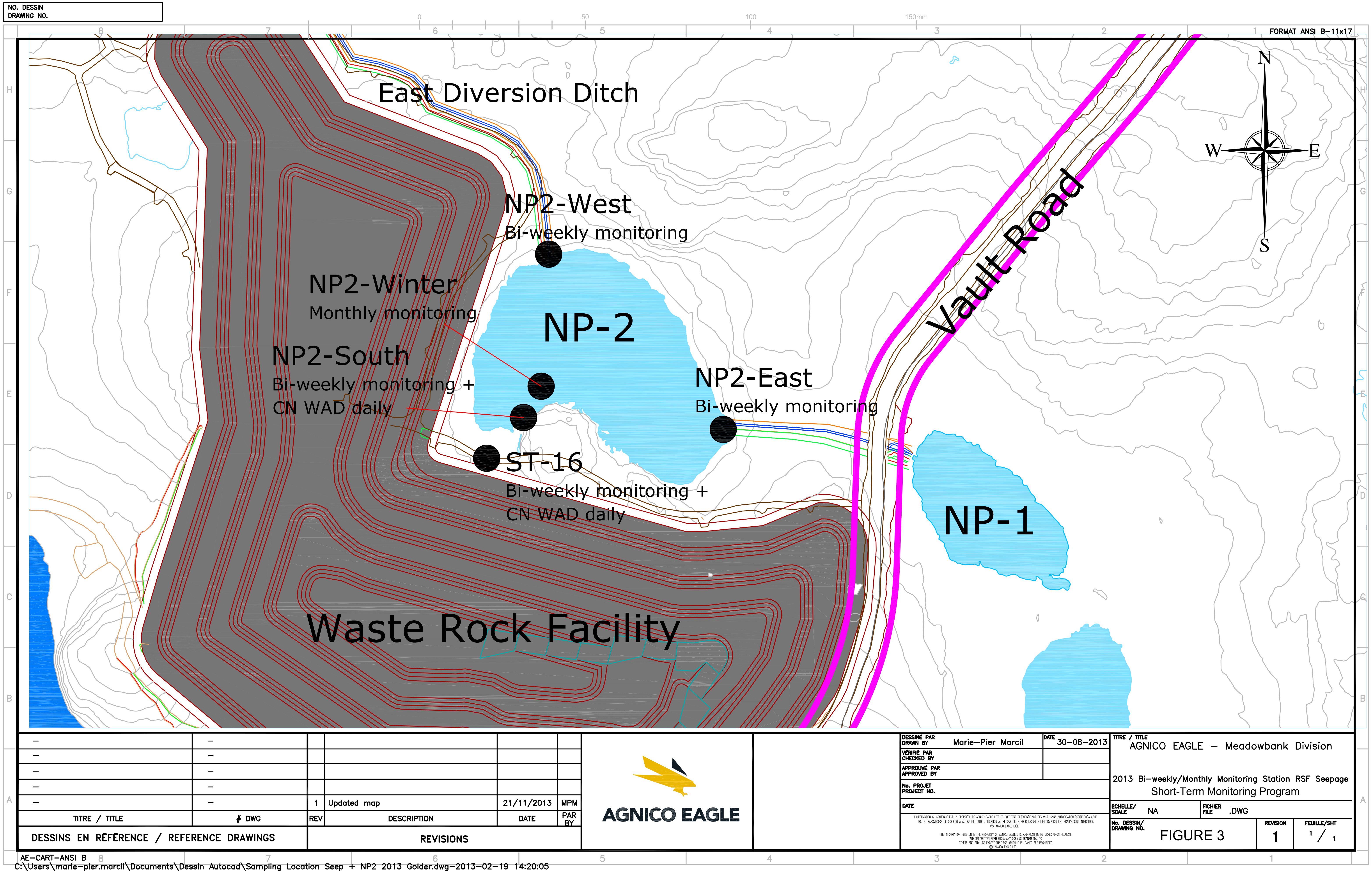

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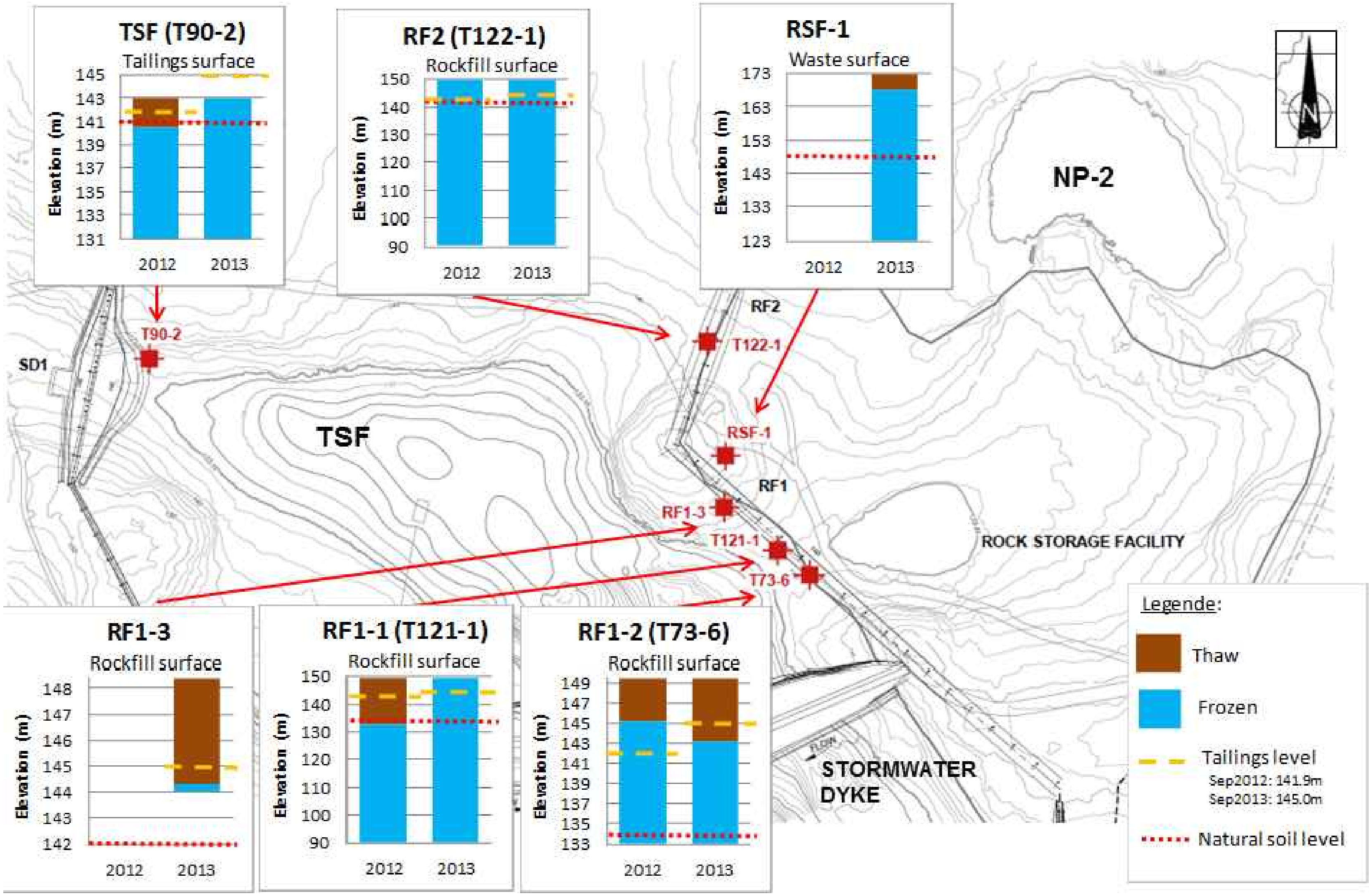

PROJECT

AGNICO-EAGLE MINES - MEADOWBANK DIVISION

TITLE

THERMISTORS LOCATION AND READINGS

Golder Associates

PROJECT No.	13-1221-0115		FILE No.	1312210115-01
DESIGN	-	-	SCALE	NOT TO SCALE
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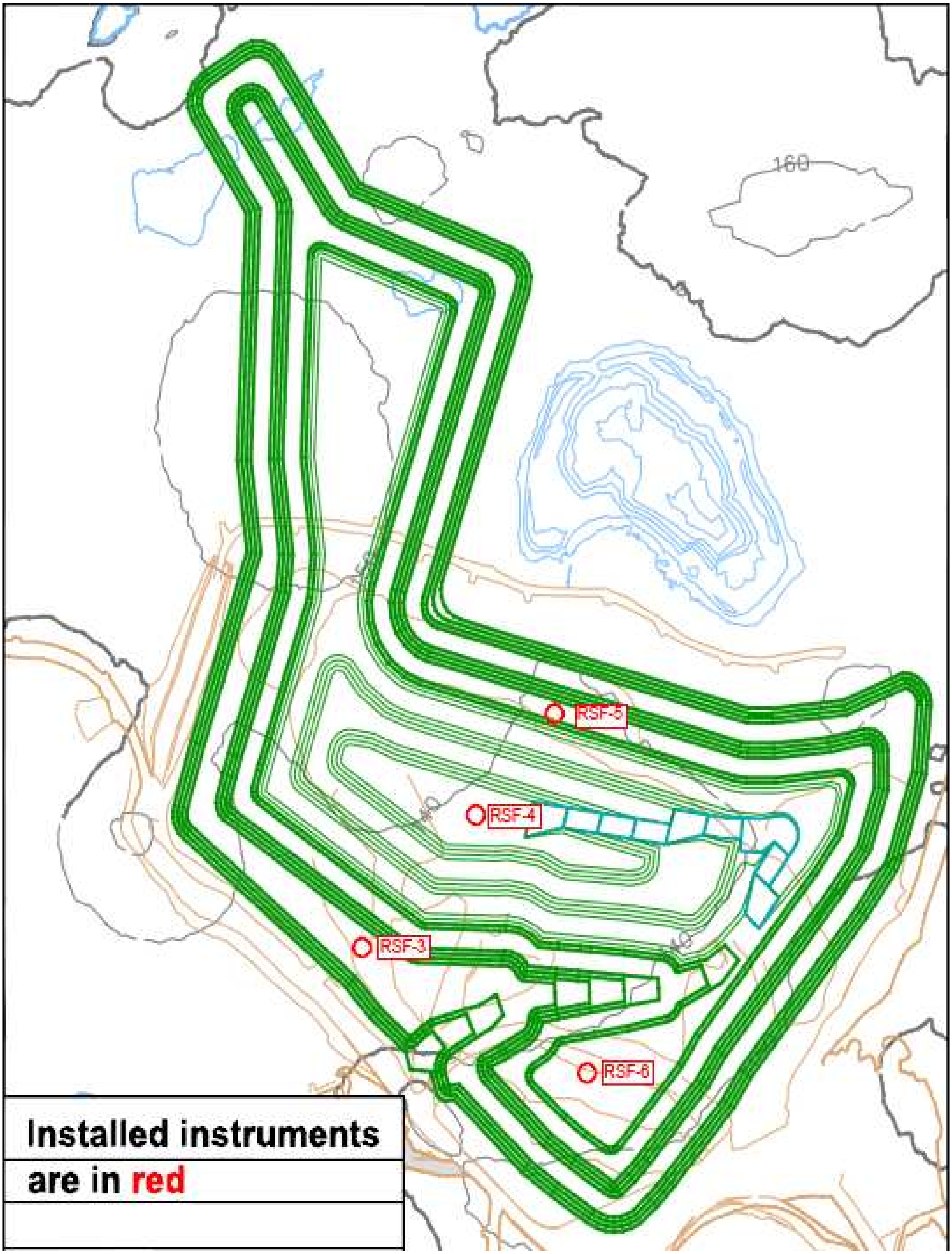
LOCATION OF THERMISTOR INSTALLED IN THE RSF IN NOVEMBER 2013



Golder Associés	Date : Dec, 2013 Project : 13-1221-0115	Figure provided by AEM	**FIGURE 5**

APPENDIX A

Chemical Analysis Results provided by AEM

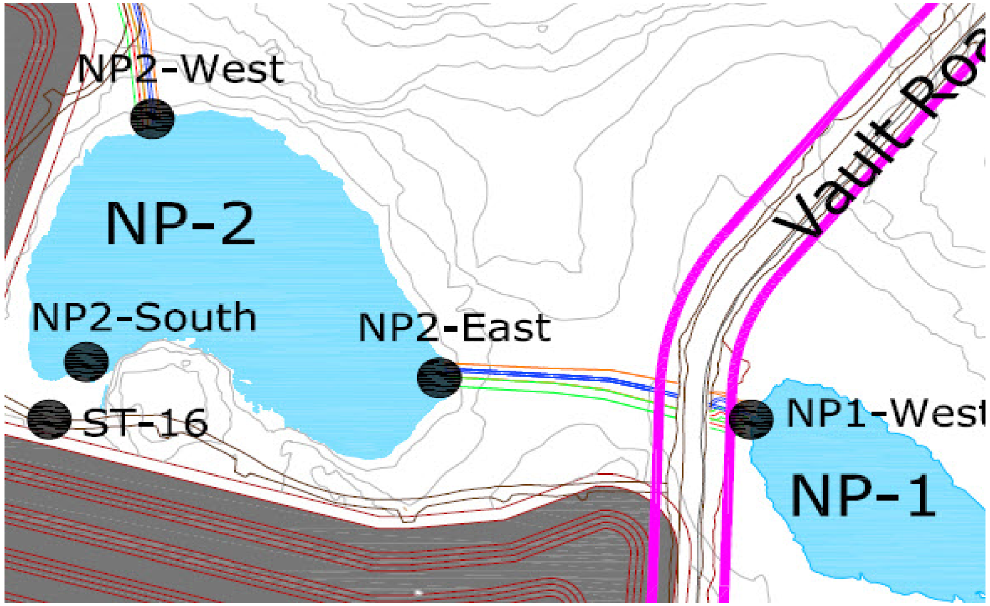
Table 1 – Historical ST-16 Results

Parameters	Date / Units	ST-16 Average 2011	ST-16 Average 2012	ST-16 11/06/2013	ST-16 04/07/2013	ST-16 Split 30/07/2013	ST-16 Split AANDC Result 30/07/2013
*pH		6.49	7.30	6.45	7.21		7.20
*Turbidity	NTU	17	34		17		123
*Conductivity	us/cm		154	420	1485		4510
Alkalinity	mg CaCo3/L	34	67	46	89	272	162
Aluminum	mg/L	0.159	0.513		0.464	0.042	0.045
Dissolved Aluminium	mg/L				0.027	< 0.006	
Ammonia	mgN/L	0.07	0.03	< 0.05	0.20	1.20	
Ammonia-nitrogen	mgN/L		0.22	0.45	7.80	34.00	
Total Dissolved Solids	mg/L	55	175	37	969	3792	
Total Suspended Solids	mg/L						50
Arsenic	mg/L	0.0020	0.0045	0.0029	0.0091	0.0139	0.0083
Dissolved As	mg/L				0.0031	0.0058	
Barium	mg/L	0.0095	0.0196		0.0741	0.1414	0.1480
Dissolved Barium	mg/L				0.0558	0.1433	
Cadmium	mg/L	0.00060	0.00004		0.00014	0.00065	0.00020
Dissolved Cadmium	mg/L				0.0001	0.0007	
Chloride	mg/L	2	3		15	450	192
Chromium	mg/L		0.0048		0.0034	0.0011	0.0010
Copper	mg/L	0.0017	0.0046	0.0028	2.3110	2.0380	3.3500
Dissolved Copper	mg/L				1.909	1.712	
Fluoride	mg/L	0.106	0.098		0.110	0.290	
Hardness	mg CaCO3/L	62	59		361	1417	1020
Iron	mg/L	1.21	1.94		1.60	4.40	21.90
Dissolved Iron	mg/L				0.17	0.06	
Lead	mg/L	0.0010	0.0056	< 0.0003	0.0015	0.0013	< 0.0001
Dissolved Lead	mg/L				< 0.0003	< 0.0003	
Manganese	mg/L	0.588	0.961		2.447	6.370	5.850
Dissolved Manganese	mg/L				2.110	6.055	
Mercury	mg/L	0.00062	0.00007		< 0.00010	0.00005	0.00015
Dissolved Mercury	mg/L				< 0.0001	< 0.0001	
Molybdenum	mg/L	0.001	0.001		0.026	0.170	0.083
Dissolved Molybdenum	mg/L				0.0204	0.1773	
Nickel	mg/L	0.0339	0.0395	0.0069	0.5149	2.0150	1.3300
Dissolved Nickel	mg/L				0.415	1.810	
Nitrate	mg/L	0.17	0.34		8.10	37.80	23.70
Selenium	mg/L	0.002	0.001		0.007	0.020	0.013
Dissolved Selenium	mg/L				0.005	0.023	

Silver	mg/L	0.0006	0.0049				0.0056
Dissolved Silver	mg/L				< 0.0002	0.0019	
Sulphate	mg/L	24	9		406	2400	1450
Thallium	mg/L	0.0025	0.0025		< 0.0050	< 0.0050	< 0.0001
Dissolved Thallium	mg/L				< 0.005	<	
Zinc	mg/L	0.005	0.008	< 0.001	0.010	0.009	< 0.005
Dissolved Zinc	mg/L				0.003	0.008	
Calcium (Ca)	mg/L						312
Magnesium (Mg)	mg/L						60
Potassium (K)	mg/L						88
Sodium (Na)	mg/L						590
Cesium	mg/L						0.0009
Rubidium	mg/L						0.0687
Ortho-Phosphate as Phosphorus	mg/L						
Antimony (Sb)	mg/L				0.0004	0.0012	0.0007
Boron (B)	mg/L				0.04	0.15	
Beryllium (Be)	mg/L				< 0.0005	< 0.0005	< 0.0001
Cobalt (Co)	mg/L				0.0729	0.3114	0.2290
Lithium (Li)	mg/L				< 0.005	0.006	0.004
Tin (Sn)	mg/L				< 0.001	< 0.001	
Strontium (Sr)	mg/L				0.44	2.14	1.40
Tianium (Ti)	mg/L				0.1300	0.5500	0.0007
Uranium (U)	mg/L				0.034	0.170	0.115
Vanadium (V)	mg/L				< 0.0005	< 0.0005	0.0011
Nitrite	mg/L				0.07	0.41	

Cyanide WAD (provided by AEM)

Date	location		
	ST-16		
	east	west	south
2013-08-21			
2013-08-27			
2013-08-28	7,280	3,38	
2013-08-29	3,960		0,2930
2013-08-30	1,520		0,0810
2013-08-31	1,290		0,0694
2013-09-01	0,970		0,0247
2013-09-02	2,830		0,0671
2013-09-03	2,500		0,0120
2013-09-04	2,490		0,5440
2013-09-05	1,600		0,0204
2013-09-07	1,650		0,0289
2013-09-10	0,671		0,3320
2013-09-13	2,150		0,0247
2013-09-15	0,459		0,0289
2013-09-17	0,443		0,0723
2013-09-19	0,493		<0.01
2013-09-21	0,070		0,0600
2013-09-23	0,050		<0.01
2013-09-25	0,063		0,0162
2013-09-27	0,148		<0.01
2013-09-29	0,556		0,0332
2013-10-01	0,091		0,0341
2013-10-02	0,204		0,0772
2013-10-08	0,154		0,0482
2013-10-11	0,069		0,0553



Data provided by AEM

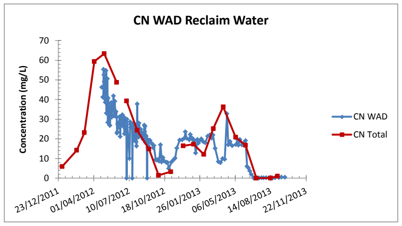
Parameters	Date / Unit	ST-16 30-juil-13	ST-16 21-août-13	ST-16 27-08-2013	ST-16 10-09-2013	ST-16 23-09-2013	ST-16 02-10-2013	NP-2 South 30-juil-13	NP-2 South 21-08-2013	NP-2 South 27-08-2013	NP-2 South 10-09-2013	NP-2 South 23-09-2013	NP-2 South 02-10-2013	NP2- winter 17-11-2013
Alaklinity	mg CaCo3/L	272			174	92	106	177			55	54	55	
Ammonia nitrogen (NH3-NH4)	mg N/L	34			11,4	7,2	8,2	27,4			3,4	3,6	3,9	
TDS	mg/L	3792			934	640	617	2854			266	277	262	
CN total	mg/L		6,47	0,036	0,18	0,068	1,2		0,069	0,007	0,013	0,014	0,03	
CN Free	mg/L				3	2,5	6				1	1	1	
pH (Env. Dept.)					7,1	7,05	7,01				7	6,73	7,47	7,36
Conductivity (Env. Dept.)					1879	1083	1095				395	442	424	501
Turbidity (Env. Dept.)	NTU				20,4	7,57	8,18				2,83	3,87	3,43	2,36
Chloride	mg/L	450			175	94,1	86	587			21,7	18,7	17,6	
Fluoride	mg/L	0,29			0,26	0,26	0,22	0,02			0,13	0,03	0,12	
Hardness	mg CaCo3/L	1417			458	216	268	1031			134	101	106	
Nitrate	mg/L	37,8			5	3,9	2,9	23,5			1,3	1,3	1,2	
Nitrite	mg/L	0,41			1	0,68	1	0,4			0,16	0,14	0,14	
Sulphate	mg/L	2400			643	338	329	1546			110	118	111	
Dissolved Aluminium (Al)	mg/L	<0.006			<0.006	<0.006	<0.006	<0.006			<0.006	<0.006	0,117	
Dissolved Arsenic (As)	mg/L	0,0058			<0.0005	<0.0001	<0.0005	0,0022			<0.0005	<0.0005	<0.0005	
Dissolved Barium (Ba)	mg/L	0,1433			0,0439	0,0223	0,032	0,1329			0,0135	0,0117	0,0133	
Dissolved Cadmium (Cd)	mg/L	0,00065			0,00009	0,00003	<0.00002	0,00022			<0.00002	<0.00002	0,00218	
Dissolved Copper (Cu)	mg/L	1,712			0,4663	0,046	0,0017	2,949			0,0081	<0.0005	0,0217	
Dissolved Iron (Fe)	mg/L	4,4			0,16	0,08	0,03	0,15			0,01	0,02	0,39	
Dissolved Lead (Pb)	mg/L	<0.0003			<0.0003	<0.0003	<0.0003	<0.0003			<0.0003	0,0011	<0.0003	
Dissolved Manganese (Mn)	mg/L	6,055			5,441	2,644	0,0337	5,427			0,1781	0,1094	0,1065	
Dissolved Mercury (Hg)	mg/L	<0.0001			<0.0001	<0.0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001	
Dissolved Molybdenum (Mo)	mg/L	0,1773			0,0222	0,0122	0,0027	0,0716			<0.0005	0,0009	0,0033	
Dissolved Nickel (Ni)	mg/L	1,81			0,3017	0,1065	0,0197	1,246			0,0324	0,0269	0,0298	
Dissolved Selenium (Se)	mg/L	0,023			0,004	0,002	0,003	0,014			<0.001	<0.001	0,001	
Dissolved Silver (Ag)	mg/L	0,0019			<0.0001	<0.0003	<0.0001	0,0024			<0.0001	<0.0001	0,0007	
Dissolved Thallium (Tl)	mg/L	<0.005			<0.005	<0.005		<0.005			<0.005	<0.005		
Dissolved Zinc (Zn)	mg/L	0,008			0,019	0,014		0,007			0,008	<0.001		
Aluminium (Al)	mg/L	0,042			0,078	0,048	0,15	0,024			0,008	0,011	0,154	
Antimony (Sb)	mg/L	0,0012			<0.0001	0,0001	<0.0001	0,0004			<0.0001	<0.0001	<0.0001	
Arsenic (As)	mg/L	0,0139		0,0241	0,0044	0,0019	<0.0005	0,0068		0,0015	<0.0005	0,001	<0.0005	
Boron (B)	mg/L	0,15			0,07	0,02	0,04	0,09			<0.01	<0.01	<0.01	
Barium (Ba)	mg/L	0,1414			0,0451	0,0239	0,0331	0,1419			0,0147	0,0133	0,0133	
Beryllium (Be)	mg/L	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	
Cadmium (Cd)	mg/L	0,00065			0,00034	<0.00002	0,00004	0,0003			<0.00002	<0.00002	<0.00002	
Copper (Cu)	mg/L	2,038		3,281	0,4963	0,0583	0,1417	3,261	0,1173	0,0887	0,0081	<0.0005	0,022	
Chromium (Cr)	mg/L	0,0011			<0.0006	<0.0006	<0.0006	<0.0006			<0.0006	<0.0006	<0.0006	
Cobalt (Co)	mg/L	0,3114			0,0808	0,0333	0,0412	0,2515			0,0106	0,0087	0,0079	
Iron (Fe)	mg/L	4,4		21,3	2,9	1,1	1,5	23,6		1,9	0,55	0,42	0,42	
Lithium (Li)	mg/L	0,006			<0.005	0,016	<0.005	0,005			<0.005	0,012	<0.005	
Manganese (Mn)	mg/L	6,37			5,533	2,628	3,287	6,464			0,1975	0,1189	0,0903	
Mercury (Hg)	mg/L	0,00005			<0.00001	<0.00001	<0.00001	0,00002			<0.00001	<0.00001	<0.00001	
Molybdenum (Mo)	mg/L	0,1704			0,0234	0,0128	0,0129	0,0871			0,0015	0,001	0,0008	
Nickel (Ni)	mg/L	2,015		1,227	0,2966	0,1092	0,1501	1,465		0,1319	0,0348	0,0287	0,037	
Lead (Pb)	mg/L	0,0013		<0.0003	<0.0003	<0.0003	<0.0003	<0.0003		<0.0003	<0.0003	<0.0003	<0.0003	
Selenium (Se)	mg/L	0,02			0,005	0,002	0,004	0,014			<0.001	<0.001	0,001	
Tin (Sn)	mg/L	<0.001			<0.001	<0.001	<0.001	<0.001			<0.001	<0.001	<0.001	
Strontium (Sr)	mg/L	2,14			0,439	0,27	0,317	1,62			0,118	0,112	0,131	
Titanium (Ti)	mg/L	0,55			0,16	0,06	0,05	0,39			0,03	0,02	0,02	
Thallium (Tl)	mg/L	<0.005			<0.005	<0.005	<0.005	<0.005			<0.005	<0.005	<0.005	
Uranium (U)	mg/L	0,17			0,018	0,006	0,008	0,144			0,002	0,001	0,001	
Vanadium (V)	mg/L	<0.0005			<0.0005	<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005	
Zinc (Zn)	mg/L	0,009		0,009	0,05	0,014	0,005	0,006		0,001	<0.001	<0.001	0,002	
							mt						mt	

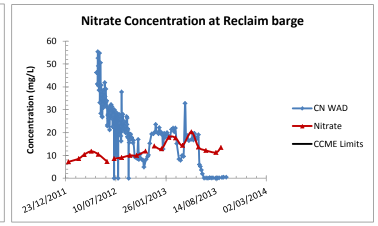
Data provided by AEM

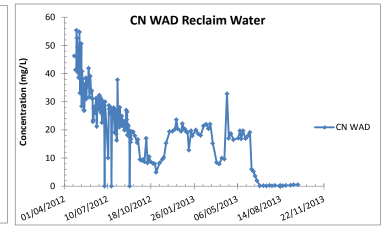
Parameters	Date	NP-2 East							NP-2 West						NP-2 North	NP-1 West	Phaser Lake		
								JK											JK
	Unit	04-août-12	21-08-2013	27-08-2013	30-08-2013	10-09-2013	23-09-2013	02-10-2013	21-08-2013	30-08-2013	10-09-2013	23-09-2013	02-10-2013	27-08-2013	21-08-2013	10-09-2013	23-09-2013	02-10-2013
Alaklinity	mg CaCo3/L					54	54	55			54,0000	54,0000	55,0000			49	49	45
Ammonia nitrogen (NH3-NH4)	mg N/L					3,2	3,8	3,9			3,1000	3,6000	3,8000			0,08	0,32	<0.01
TDS	mg/L					281	276	264			284,0000	279,0000	263,0000			36	36	36
CN total	mg/L			0,012	0,018	0,011	0,014	0,014		0,0100	0,0170	0,0150	0,0170	0,017		0,007	<0.005	<0.005
CN Free	mg/L					1	<1	1			3	<1	1			<1	<1	<1
pH (Env. Dept.)						7,07	6,98	7,34			7,0400	6,8400	7,5400			6,83	7,12	7,57
Conductivity (Env. Dept.)						403	439	418			400,0000	446,0000	419,0000			37	56,2	60,1
Turbidity (Env. Dept.)	NTU					2,71	4,7	3,05			3,6800	3,7500	3,1400			0,7	0,68	0,56
Chloride	mg/L					21,3	19,2	16,8			20,9000	19,0000	17,1000			1,2	0,8	1,1
Fluoride	mg/L					0,12	0,02	0,12			0,0900	0,0200	0,1500			0,15	0,03	0,12
Hardness	mg CaCo3/L					122	104	108			131,0000	94,0000	102,0000			26	19	23
Nitrate	mg/L					3,1	1,3	1,4			1,2000	1,3000	1,3000			0,03	0,07	0,15
Nitrite	mg/L					0,16	0,14	0,14			0,1600	0,1400	0,1600			<0.01	<0.01	<0.01
Sulphate	mg/L					110	115	113			111,0000	118,0000	113,0000			3,9	8,3	4,2
Dissolved Aluminium (Al)	mg/L					0,012	<0.006	<0.006			0,0270	<0.006	<0.006			<0.006	<0.006	<0.006
Dissolved Arsenic (As)	mg/L					<0.0005	<0.0005	0,0006			<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	0,0006
Dissolved Barium (Ba)	mg/L					0,0133	0,0127	0,0136			0,0129	0,0114	0,0138			0,002	0,0019	0,0026
Dissolved Cadmium (Cd)	mg/L					<0.00002	<0.00002	<0.00002			<0.00002	<0.00002	<0.00002			<0.00002	<0.00002	<0.00002
Dissolved Copper (Cu)	mg/L					0,0143	<0.0005	0,006			0,0142	<0.0005	0,0048			0,0006	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L					0,02	0,03	0,02			0,0100	0,0100	0,0200			<0.01	<0.01	<0.01
Dissolved Lead (Pb)	mg/L					<0.0003	<0.0003	<0.0003			<0.0003	<0.0003	<0.0003			<0.0003	<0.0003	<0.0003
Dissolved Manganese (Mn)	mg/L					0,1889	0,1226	0,0812			0,1856	0,0995	0,0643			<0.0005	<0.0005	<0.0005
Dissolved Mercury (Hg)	mg/L					<0.0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001
Dissolved Molybdenum (Mo)	mg/L					<0.0005	0,0008	0,0011			<0.0005	0,0007	0,0011			<0.0005	<0.0005	<0.0005
Dissolved Nickel (Ni)	mg/L					0,0312	0,0266	0,0243			0,0313	0,0238	0,0243			<0.0005	<0.0005	<0.0005
Dissolved Selenium (Se)	mg/L					<0.001	0,001	0,001			<0.001	<0.001	0,0010			<0.001	<0.001	<0.001
Dissolved Silver (Ag)	mg/L					<0.0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001			<0.001	<0.001	<0.0001
Dissolved Thallium (Tl)	mg/L					<0.005	<0.005				<0.005	<0.005				<0.005	<0.005	
Dissolved Zinc (Zn)	mg/L					0,01	<0.001				0,0200	<0.001				<0.001	<0.001	
Aluminium (Al)	mg/L	0,046				0,122	<0.006	0,067			0,0270	0,0150	0,0790			0,023	<0.006	<0.006
Antimony (Sb)	mg/L	0,0001				0,0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001			<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	<0.0005		<0.0005	<0.0005	0,0006	<0.0005	0,0015		0,0006	0,0009	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	0,0022
Boron (B)	mg/L	0,09				<0.01	<0.01	<0.01			<0.01	<0.01	<0.01			<0.01	<0.01	<0.01
Barium (Ba)	mg/L	0,0135				0,013	0,0128	0,0146			0,0143	0,0121	0,0143			0,0024	0,0019	0,0029
Beryllium (Be)	mg/L	<0.0005				<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005
Cadmium (Cd)	mg/L	<0.00002				<0.00002	<0.00002	0,00002			<0.00002	<0.00002	<0.00002			<0.00002	<0.00002	<0.00002
Copper (Cu)	mg/L	0,1713	0,0399	0,0389	0,0388	0,0302	<0.0005	0,0241	0,0406	0,0404	0,0298	<0.0005	0,0182	0,0405	<0.0005	<0.0005	<0.0005	<0.0005
Chromium (Cr)	mg/L	0,0018				<0.0006	<0.0006	<0.0006			<0.0006	<0.0006	<0.0006			<0.0006	<0.0006	<0.0006
Cobalt (Co)	mg/L	0,0132				0,0094	0,0089	0,0082			0,0104	0,0079	0,0076			<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	0,41		0,48	0,47	0,43	0,41	0,51		0,49	0,59	0,47	0,48	0,61		<0.01	<0.01	0,04
Lithium (Li)	mg/L	0,01				<0.005	0,006	<0.005			<0.005	0,0120	<0.005			<0.005	<0.005	<0.005
Manganese (Mn)	mg/L	0,4091				0,1862	0,1301	0,0953			0,2023	0,1130	0,0939			<0.0005	<0.0005	0,0006
Mercury (Hg)	mg/L	<0.00001				<0.00001	<0.00001	<0.00001			<0.00001	<0.00001	<0.00001			<0.00001	<0.00001	<0.00001
Molybdenum (Mo)	mg/L	0,0035				0,0006	0,0008	0,0009			0,0012	0,0008	0,0008			<0.0005	<0.0005	<0.0005
Nickel (Ni)	mg/L	0,0568		0,0330	0,0354	0,0291	0,0288	0,0275		0,0363	0,0327	0,0259	0,0263	0,0319		<0.0005	<0.0005	0,0005
Lead (Pb)	mg/L	0,0099		<0.0003	<0.0003	<0.0003	<0.0003	<0.0003		0,0014	<0.0003	<0.0003	<0.0003	<0.0003		<0.0003	<0.0003	<0.0003
Selenium (Se)	mg/L	<0.001				<0.001	<0.001	<0.001			<0.001	<0.001	<0.001			<0.001	<0.001	<0.001
Tin (Sn)	mg/L	0,003				<0.001	<0.001	<0.001			<0.001	<0.001	<0.001			<0.001	<0.001	<0.001
Strontium (Sr)	mg/L	0,118				0,107	0,094	0,123			0,1050	0,1090	0,1330			0,026	0,027	0,032
Titanium (Ti)	mg/L	0,03				0,02	0,02	0,01			0,0300	0,0200	0,0100			<0.01	<0.01	<0.01
Thallium (Tl)	mg/L	<0.005				<0.005	<0.005	<0.005			<0.005	<0.005	<0.005			<0.005	<0.005	<0.005
Uranium (U)	mg/L	0,003				0,001	0,001	0,001			0,0020	0,0010	0,0010			<0.001	<0.001	<0.001
Vanadium (V)	mg/L	<0.0005				<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005			<0.0005	<0.0005	<0.0005
Zinc (Zn)	mg/L	<0.001		<0.001	0,008	<0.001	<0.001	0,002		0,0150	<0.001	0,0010	0,0020	0,004		<0.001	<0.001	0,001
													mt			mt		

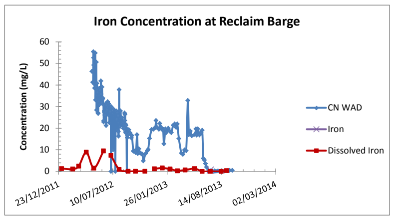
CN in the tailing pond

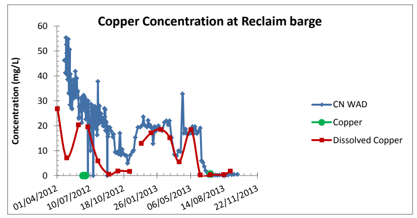
Date	CN wad (Assay lab)	CN wad (multilab)	CN free (multilab)	CN tot (multilab)
	ppm	mg/L	mg/L	mg/L
03/04/2012				59.37
24/04/2012	46.3			
26/04/2012		33.01		79.14
27/04/2012	41.3			
28/04/2012	41.2			
29/04/2012	55.4			
30/04/2012	52.6			
01/05/2012	49.2			63.38
02/05/2012	40.5			
03/05/2012	41.6			
04/05/2012	38.6			
05/05/2012	38.5			
06/05/2012	54.8			
07/05/2012	33.1			
08/05/2012	40.9			
09/05/2012	39.2			
10/05/2012	50.6			
11/05/2012	28.4			
12/05/2012	40.8			
13/05/2012	38			
14/05/2012	35.3			
15/05/2012	36.5			
16/05/2012	27.1			
17/05/2012	26.8			
18/05/2012	32.3			
19/05/2012	31.2			
20/05/2012	35.4			
21/05/2012	38.5	22.93		52.76
22/05/2012	31			
23/05/2012	36.1			
24/05/2012	37.7			
25/05/2012	35.4			
26/05/2012	36.3			
27/05/2012	41.9			
28/05/2012	35.8			
29/05/2012	31.7			
30/05/2012	39.1			
31/05/2012	39.1			
01/06/2012	34			
02/06/2012	33.5			
03/06/2012	34			
05/06/2012	31			
06/06/2012	22.9			
07/06/2012	23.5			
08/06/2012	27.6			
09/06/2012	28.1			
10/06/2012	27.3			
11/06/2012	26.1			
12/06/2012	28.1			
13/06/2012	31.2			
14/06/2012	27.8			
15/06/2012	21.2			
16/06/2012	27.5			
17/06/2012	27.5			
18/06/2012	30.7			
19/06/2012	28.6			
20/06/2012	32			
21/06/2012	32.3			
22/06/2012	27			
23/06/2012	29.8	29.7		
24/06/2012	31.4			
25/06/2012	26			
26/06/2012	27.2			
27/06/2012	22.6			
28/06/2012	30.4			
29/06/2012	27			
30/06/2012	27.7			
01/07/2012	29.7			
02/07/2012	29.7			
03/07/2012	???			
04/07/2012	30			
11/07/2012	10			
13/07/2012	28.7			
14/07/2012	27.4			
15/07/2012	25.9			
16/07/2012	27.4			
18/07/2012	27.8			
19/07/2012	???			
20/07/2012	25.9			
21/07/2012	26.9			
22/07/2012	27.3			
23/07/2012	25.9			
24/07/2012	27.9			
25/07/2012	24.1			
26/07/2012	19.1			
27/07/2012	27.2			
28/07/2012	25.74			
29/07/2012	25.8			
30/07/2012	18.5			
31/07/2012	16.3			
01/08/2012	22.8			
02/08/2012	37.8			
03/08/2012	23.7			
04/08/2012	23.6	24.0714286		
05/08/2012	23.4			
06/08/2012	20.9			
07/08/2012	28			

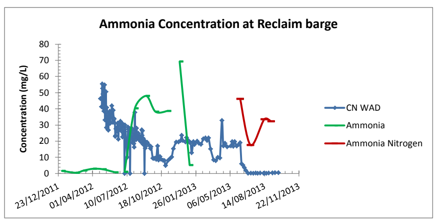


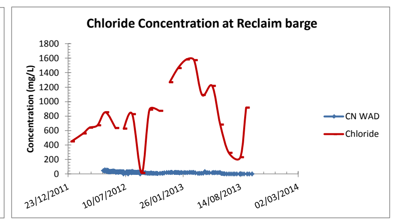


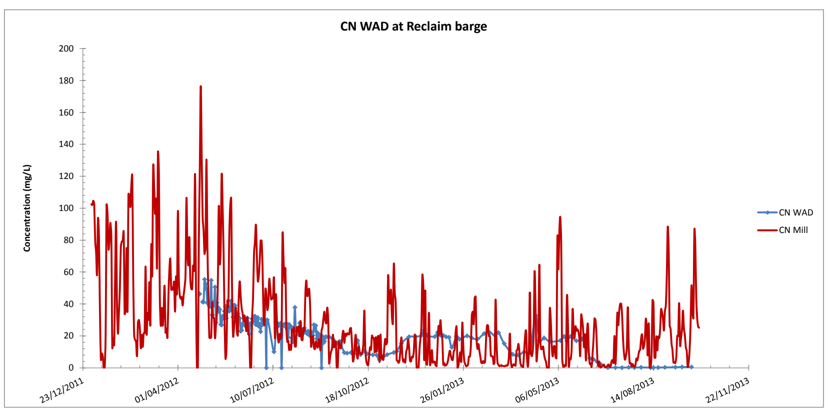












CN in the tailing pond

Date	CN wad (Assay lab)	CN wad (multilab)	CN free (multilab)	CN tot (multilab)
	ppm	mg/L	mg/L	mg/L
08/08/2012	24.4			
09/08/2012	23.3			
10/08/2012	22.8			
11/08/2012	21.7	23.5		
12/08/2012	24.9			
13/08/2012	23			
14/08/2012	22.1			
15/08/2012	21.3			
16/08/2012	23			
17/08/2012	21.3			
18/08/2012	19.9	22.2142857		
19/08/2012	22.6			
20/08/2012	21.6			
21/08/2012	20.2			
22/08/2012	27			
23/08/2012	23.6			
24/08/2012	26.4			
25/08/2012	18.2	22.8		
26/08/2012	21.8			
27/08/2012	21.2			
28/08/2012	17.7			
29/08/2012	19.4			
30/08/2012	None			
31/08/2012	19.6			
01/09/2012	15.6	18		
02/09/2012	16.7			
03/09/2012	19.3			
04/09/2012	19.3			
07/09/2012	19.3	18.65		
11/09/2012	17.9			
16/09/2012	15.5			
18/09/2012	16.6			
23/09/2012	9.45			
26/09/2012	9.19			
30/09/2012	9.53	9.36		
03/10/2012	8.68			
07/10/2012	17			
10/10/2012	8.26			
14/10/2012	10.5			
17/10/2012	8.77			
23/10/2012	8.09	10.2166667		
27/10/2012	7.96			
30/10/2012	4.91			
07/11/2012	8.22			
14/11/2012	9.57			
17/11/2012	10.2			
22/11/2012	15.3			
30/11/2012	19.4			
07/12/2012	19.5			
13/12/2012	20.3			
16/12/2012	23.6			
19/12/2012	20.4			
27/12/2012	19.5	41.7		
30/12/2012	22.2	20.85		
02/01/2013	20.4			
05/01/2013	20.3			
08/01/2013	19.3			
11/01/2013	19.1			
14/01/2013	12.8			
19/01/2013	19.7			
22/01/2013	17.9			
30/01/2013	20.0			
04/02/2013	18.7			
10/02/2013	18.0			
17/02/2013	21.4			
23/02/2013	22.0			
28/02/2013	20.4			
04/03/2013	22.0			
10/03/2013	15.2			
19/03/2013	8.4			
25/03/2013	7.9			
31/03/2013	10.0			
06/04/2013	9.6			
12/04/2013	32.8			
16/04/2013	17.0	1.24	3	19.87
21/04/2013	18.7			
27/04/2013	16.5			
08/05/2013	17.1			
12/05/2013	19.7			
15/05/2013	16.8			
19/05/2013	19.7			
25/05/2013	16.9			
31/05/2013	18			
04/06/2013	19.1			
08/06/2013	6.01			
12/06/2013	5.21			
16/06/2013	3.64			
20/06/2013	2.0			
27/06/2013	0.0967			
05/07/2013	0.156			
12/07/2013	0.0829			
19/07/2013	0.247			
25/07/2013	0.142			
01/08/2013	0.237			
11/08/2013	0.0829			
14/08/2013	0.0765			
19/08/2013	0.133			
26/08/2013	0.242			
06/09/2013	0.355			
13/09/2013	0.501			
23/09/2013	0.499			

Calendar reference	**ST-21 (a)**
Sample ID	**ST-21**
Old calendar reference	**SW2a /SW2b**
Sampling location	**Tailings reclaim pond (reclaim pond)**

Number bold - italic = < LMD

Frequency	**Parameters**	**Date** / **Units**	**03/01/2012**	**13/02/2012**	**06/03/2012**	**03/04/2012**	**01/05/2012**	**05/06/2012**	**19/06/2012**	**26/06/2012**	**03/07/2012**	**02/08/2012**	**04/09/2012**	**01/10/2012**
ST-21 (a)	Alkalinity	(mg CaCO3/L)	126	125	147	157	145	75			98	102	117	114
Monthly (open water)	Ammonia (NH3)	mg/L	1.6	0.44	1.8	2.9	2.6	0.73			1	40.3	48	38.2
	Chloride	mg/L	449	559	639	672	853	634			626	826	13.5	889
	Cyanide (Cn(tot))	mg/L	5.89	14.22	23.18	59.37	63.38	48.76			39.26	24.34	14.87	1.44
	Fluoride	mg/L	0.5	0.49	0.54	0.3	2.5	***0.02***			0.06	0.23	0.52	0.48
	Hardness	(mg CaCO3/L)	914	1087	1057	1369	1008	1001			574	771	1045	1313
	Nitrate (NO3)	mg/L	7.2	8.6	10.4	11.8	10.5	7.3			8.6	9.1	10	10
	Nitrite (NO2)	mg/L	0.23	0.22	0.21	0.2	0.17	0.12			0.1	0.12	0.15	0.12
	pH		8.42	8.03	8.49	9.06	9.39	8.74	7.89		8.94	8.47	8.04	7.89
	Sulphate (SO2-4)	mg SO4/L	1825	2173	2477	2384	2508	1555			1457	1551	1703	1910
	TDS	mg/L	3012	3334	3620	3843	3374	4955			2343	2590	3213	3206
	Turbidity	NTU	0.88	2.53	6.49	2.51	2.21	14.74	12.36		16.8	4.18	3.87	4.16
	Dissolved Ag	mg/L	0.006	0.008	***0.005***	***0.005***	0.005	***0.005***			0.068	***0.005***	0.005	***0.005***
	Dissolved Al	mg/L	0.02	***0.01***	***0.01***	0.02	0.41	***0.01***			***0.01***	***0.01***	0.02	0.05
	Dissolved As	mg/L	0.045	0.018	0.015	0.041	0.071	0.006			0.011	0.012	0.009	0.008
	Dissolved Ba	mg/L	0.048	0.078	0.096	0.066	0.052	0.029			0.034	0.043	0.057	0.077
	Dissolved Cd	mg/L	***0.005***	***0.005***	***0.005***	***0.005***	***0.005***	***0.005***			***0.005***	***0.005***	0.005	***0.005***
	Dissolved Cu	mg/L	7.68	6.83	9.91	26.85	7.13	20.39			19.58	5.94	0.549	1.86
	Dissolved Fe	mg/L	1.3	1.1	2.4	8.9	1.5	9.5			7.4	0.93	0.05	***0.05***
	Dissolved Hg	mg/L	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***			***0.0005***	0.0005	0.0005	***0.0005***
	Dissolved Mn	mg/L	0.023	0.034	0.032	***0.005***	0.032	***0.005***			0.009	0.005	0.017	0.095
	Dissolved Mo	mg/L	0.29	0.308	0.332	0.0005	0.31	0.232			0.262	0.29	0.349	0.361
	Dissolved Ni	mg/L	0.455	0.887	1.52	0.6	1.21	2.01			2.54	2.22	1.28	1.08
	Dissolved Pb	mg/L	***0.005***	***0.005***	***0.005***	0.009	***0.005***	0.005			***0.005***	***0.005***	0.005	***0.005***
	Dissolved Se	mg/L	***0.005***	***0.005***	0.006	0.014	0.021	0.013			0.009	0.02	0.015	0.014
	Dissolved Tl	mg/L	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***			***0.01***	***0.01***	0.01	***0.01***
	Dissolved Zn	mg/L	0.018	0.01	0.006	***0.005***	1.39	***0.005***			0.034	***0.005***	0.005	0.006
	Ammonia-Nitrogen	mg/L												
	Ag	mg/L							0.158	0.263				
	Al	mg/L							0.0049	0.0119				
	As	mg/L							0.0305	0.0321				
	Ba	mg/L							***0.0005***	***0.0005***				
	Be	mg/L							0.00055	0.00019				
	Cd	mg/L							0.0092	0.0213				
	Co	mg/L							1.038	2.744				
	Cu	mg/L							***0.0006***	0.0106				
	Cr	mg/L							0.83	0.7				
	Fe	mg/L												
	Hg	mg/L							***0.005***	***0.005***				
	Li	mg/L							0.0194	0.0314				
	Mn	mg/L							0.2209	0.2576				
	Mo	mg/L							1.354	1.68				
	Ni	mg/L							0.0006	***0.0003***				
	Pb	mg/L							0.0007	***0.0001***				
	Sb	mg/L							0.009	0.008				
	Se	mg/L							***0.001***	***0.001***				
	Sn	mg/L							1.1	0.837				
	Sr	mg/L							0.34	0.43				
	Ti	mg/L							***0.005***	***0.005***				
	Tl	mg/L							0.01	0.009				
	U	mg/L							***0.0005***	***0.0005***				
	V	mg/L							***0.001***	0.015				
	Zn	mg/L												

Calendar reference	**ST-21 (a)**
Sample ID	**ST-21**
Old calendar reference	**SW2a /SW2b**
Sampling location	**Tailings reclaim pond (reclaim pond)**

Frequency	**Parameters**	**Date** / **Units**	**05/11/2012**	**03/12/2012**	**10/12/2012**	**08/01/2013**	**06/02/2013**	**05/03/2013**	**02/04/2013**	**07/05/2013**	**04/06/2013**	**04/07/2013**	**13/08/2013**	**02/09/2013**
ST-21 (a)	Alkalinity	(mg CaCO3/L)	129		134	115	134	142	113	106	77	127	154	143
Monthly (open water)	Ammonia (NH3)	mg/L	38.7		69.3	5.2					46.2			
	Chloride	mg/L	872		1267	1463	1582	1572	1092	1217	683	292	232	917
	Cyanide (Cn(tot))	mg/L	3.26		16.45	17.3	12.11	25.19	36.25	20.85	16.77	0.008	0.054	0.991
	Fluoride	mg/L	0.07		0.22	21.9	0.33	0.23	0.38	0.33	0.07	0.26	1.1	0.16
	Hardness	(mg CaCO3/L)	1177		1497	1607	2116	1795	1525	1583	891	662	751	759
	Nitrate (NO3)	mg/L	11.9		14.1	12.9	17.9	17.7	14.4	20.3	13.7	12.2	11.3	13.5
	Nitrite (NO2)	mg/L	0.07		0.19	0.27	0.29	0.16	0.34	0.33	0.06	0.31	0.9	1.1
	pH		8.09	8.59	8.14	9.04	9.42	9.14	8.9	9	8.85	8.28	7.72	8
	Sulphate (SO2-4)	mg SO4/L	2332		2644	2960	3125	2876	2248	2304	1276	1085	1169	1457
	TDS	mg/L				4943	568	5354	4242	4476	2954	1988		2020
	Turbidity	NTU	4.94	1.9	1.13	1.01	36.7	21.9	43.3	8.8	17.37	9.25	5.65	20.1
	Dissolved Ag	mg/L	***0.005***		0.015	***0.005***	0.011	0.01	***0.005***	0.0138	0.0044	***0.0002***	0.0057	0.0138
	Dissolved Al	mg/L	0.02		0.04	0.05	0.34	0.02	0.08	0.093	0.136	0.152	0.14	0.204
	Dissolved As	mg/L	0.011		0.012	0.019	0.012	0.01	0.011	0.0165	0.0078	0.0137	0.0161	0.0246
	Dissolved Ba	mg/L	0.082		0.084	0.107	0.101	0.144	0.096	0.104	0.0566	0.0465	0.0606	0.0667
	Dissolved Cd	mg/L	***0.005***		***0.005***	***0.005***	***0.005***	***0.005***	***0.005***	0.00085	0.00054	0.00035	0.00068	0.00089
	Dissolved Cu	mg/L	1.71		12.96	17.17	18.55	15.21	5.56	18.43	0.2915	0.3915	0.4183	1.777
	Dissolved Fe	mg/L	***0.05***		1.2	1.6	1.1	0.3	0.67	1.3	***0.01***	***0.01***	0.01	0.38
	Dissolved Hg	mg/L	***0.0005***		0.0003	0.0002	0.0003	***0.0001***	0.0002	0.0002	***0.0001***	***0.0001***	0.0001	0.0001
	Dissolved Mn	mg/L	0.039		0.007	***0.005***	0.071	0.009	***0.005***	***0.0005***	0.0713	0.4254	0.5621	0.4087
	Dissolved Mo	mg/L	0.411		0.437	0.492	0.481	0.469	0.332	0.4128	0.2472	0.171	0.2217	0.3091
	Dissolved Ni	mg/L	0.183		0.152	0.056	0.032	0.041	0.026	0.808	0.0876	0.0962	0.2999	0.6015
	Dissolved Pb	mg/L	***0.005***		***0.005***	***0.005***	***0.005***	***0.005***	***0.005***	***0.0003***	***0.0003***	***0.0003***	0.0012	0.0045
	Dissolved Se	mg/L	0.019		0.021	0.023	0.026	0.037	0.019	0.026	0.008	0.01	0.01	0.009
	Dissolved Tl	mg/L	***0.01***		***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.005***	***0.005***	***0.005***	***0.005***	***0.005***
	Dissolved Zn	mg/L	***0.005***		0.006	0.005	0.569	***0.005***	0.015	0.009	0.001	0.004	0.004	0.015
	Ammonia-Nitrogen	mg/L									46.2	17.6	33.5	32.3
	Ag	mg/L												
	Al	mg/L										0.409		
	As	mg/L										0.0208		
	Ba	mg/L										0.0598		
	Be	mg/L										***0.0005***		
	Cd	mg/L										0.00043		
	Co	mg/L												
	Cu	mg/L										0.6531		
	Cr	mg/L										0.0007		
	Fe	mg/L										0.56		
	Hg	mg/L										***0.00001***		
	Li	mg/L										***0.005***		
	Mn	mg/L										0.5164		
	Mo	mg/L										0.2041		
	Ni	mg/L										0.1204		
	Pb	mg/L										0.0045		
	Sb	mg/L										0.0014		
	Se	mg/L										0.012		
	Sn	mg/L										***0.001***		
	Sr	mg/L										0.798		
	Ti	mg/L										0.29		
	Tl	mg/L										***0.005***		
	U	mg/L										0.009		
	V	mg/L										***0.0005***		
	Zn	mg/L										0.006		

Exova
237 rue de Liverpool
Saint-Augustin-de-Desmaures
Québec
Canada
G3A 2C8

Sans Frais: +1 (866) 365-2310
T : +1 (418) 878-4927
F : +1 (418) 878-7185
E : ventes@exova.com
W: www.exova.com

Exova
121 Boulevard Hymus
Pointe-Claire
Québec
Canada
H9R 1E6

T : +1 (514) 697-3273
F : +1 (514) 697-2090
E : ventes@exova.com
W: www.exova.com

Certificate of Analysis

Request number:	**13-558291**
Date Received:	2013-08-30
Date Certificate Issued:	2013-09-13
Certificate Version:	1

☑ Official Certificate of Analysis

☐ Preliminary Certificate of Analysis

Client

MULTI-LAB DIRECT - Val d' Or

900, 5e Avenue
Val-d'Or, Québec, Canada
J9P 1B6
Telephone : (819) 874-0350
Fax : (819) 874-0360

P.O. Number	Your project ID.	Project Manager
NA	29228	M. Roger Turmel

Comments

This version replaces and cancels all earlier version.

NA : Information Not Available

Exova
237 rue de Liverpool
Saint-Augustin-de-Desmaures
Québec
Canada
G3A 2C8

Sans Frais: +1 (866) 365-2310
T : +1 (418) 878-4927
F : +1 (418) 878-7185
E : ventes@exova.com
W: www.exova.com

Exova
121 Boulevard Hymus
Pointe-Claire
Québec
Canada
H9R 1E6

T : +1 (514) 697-3273
F : +1 (514) 697-2090
E : ventes@exova.com
W: www.exova.com

Certificate of Analysis

Client: MULTI-LAB DIRECT - Val d' Or

Request Number: 13-558291

P.O. Number	Your Project ID.	Project Manager
NA	29228	M. Roger Turmel

Sample(s)

Lab. No.	**2428475**
Your Reference	29228 NP-2-North
Matrix	Wastewater
Sampled by	M. Samuel Tapp / Jamie Kataluk
Site sampled	Meadowbank
Date sampled	2013-08-28
Date received	2013-08-30

Parameter(s)
Method
Reference

Résultats toxicité truite	Preparation	-
QE006-01 (Accredited)	Analysis	-
	Sequential No.	NA
LC50-96h	% v/v	>100
% mortality at 100% v/v	% mort 96h	NA
CI 95% lower		NA
CI 95% upper		NA
Code Statistical method		AUCUN
Toxic units	U.T.	<1.0
Conclusion		Not lethal
Analysis details		APPENDIX

Exova
237 rue de Liverpool
Saint-Augustin-de-Desmaures
Québec
Canada
G3A 2C8

Sans Frais: +1 (866) 365-2310
T : +1 (418) 878-4927
F : +1 (418) 878-7185
E : ventes@exova.com
W: www.exova.com

Exova
121 Boulevard Hymus
Pointe-Claire
Québec
Canada
H9R 1E6

T : +1 (514) 697-3273
F : +1 (514) 697-2090
E : ventes@exova.com
W: www.exova.com

Certificate of Analysis

Client: **MULTI-LAB DIRECT - Val d' Or** **Request Number:** **13-558291**

P.O. Number	Your Project ID.	Project Manager
NA	29228	M. Roger Turmel

Sample(s)

Lab. No.	**2428475**
Your Reference	29228 NP-2-North
Matrix	Wastewater
Sampled by	M. Samuel Tapp / Jamie Kataluk
Site sampled	Meadowbank
Date sampled	2013-08-28
Date received	2013-08-30

Parameter(s)
Method
Reference

Comments:

2428475 29228 NP-2-North Truites - Type d'essai : CL50

Note 1: Results and comments, if any, relate only to samples submitted for analysis at the Saint-Augustin-de-Desmaures laboratory.

Linda Bouchard, biologist

Appendix

Client: MULTI-LAB DIRECT **Request number:** 13-558291

BIOASSAY Rainbow trout

Lab. No: 2428475
Your reference: 29228 NP-2-North
Matrix: Wastewater
Sampled by: M. Samuel Tapp / Jamie Kataluk
Site sampled: Meadowbank

Sampling method: Grab
Date sampled (date and hour): 2013-08-28 08:00:00
Date received (date and hour): 2013-08-30 08:00:00
State of sampled received: Conform

Date and hour start analysis (0hrs): 2013-09-01 14:00
Date and hour end analysis (96hrs): 2013-09-05 14:00

Analysed by: JB JG

Organisms: *Oncorhynchus mykiss* ; Acclimation: ≥ 2 weeks
% mortality 7 days before test:<1
Lot #: PAV130809
Average weight of control fish (g): 0.45 **Minimum:** 0.33 **Maximum:** 0.54
± std. dev.: 0.07
Average fork length of control fish (mm): 36.4 **Minimum:** 32 **Maximum:** 43
± std. dev.: 3.5
Number of fish/container: 10
Loading density (g/L): 0.45
Volume of test solutions (L): 10
Height of test solutions (cm): 22
Photoperiod: 16hrs light / 8hrs darkness
Dilution water: Dechlorinated municipal water
Pre-aeration of sample: 30 minutes
Pre-aeration and aeration rate (mL/min/L ±1): 6.5
Pre-treatment of sample: NA
Protocol / Reference method: SPE1/RM/13, 2000, mod. 05/2007
No modification to protocol

sample concentration (% v/v)	number of fish 0 hrs	volume (L)	atypical or stressed 96hrs (number)	atypical or stressed 96hrs (%)	mortality 96hrs (number)	mortality 96hrs (%)	temperature (°C)		pH		dissolved oxygen (mg/L)		conductivity (µS/cm)
							0hrs	96hrs	0hrs	96hrs	0hrs	96hrs	0hrs
0.00	10	10	0	0	0	0	15.5	14.6	7.8	7.7	9.6	9.6	291
6.25	10	10	0	0	0	0	15.5	14.6	7.8	7.7	9.8	9.1	299
12.50	10	10	0	0	0	0	15.5	14.4	7.8	7.7	9.7	9.3	301
25.00	10	10	0	0	0	0	15.5	14.3	7.8	7.6	9.9	9.2	324
50.00	10	10	0	0	0	0	15.6	14.3	7.7	7.5	9.0	9.1	357
100.0	10	10	0	0	0	0	15.8	14.2	7.5	7.4	9.5	9.1	421
Sample characteristics before analysis			Appearance: Yellow,clear				15.8		7.5		8.9		419

Reference assay (Phenol)
Reference assay date: 2013-08-30
LC50-96h (mg/L of Phenol): 10.82
Lower C.I. at 95%: 9.000
Lower C.I. at 95%: 13.00

Geometric average: 9.110
Lower control limit: 6.580
Upper control limit: 11.63

Exova
237 rue de Liverpool
Saint-Augustin-de-Desmaures
Québec
Canada
G3A 2C8

Sans Frais: +1 (866) 365-2310
T : +1 (418) 878-4927
F : +1 (418) 878-7185
E : ventes@exova.com
W: www.exova.com

Exova
121 Boulevard Hymus
Pointe-Claire
Québec
Canada
H9R 1E6

T : +1 (514) 697-3273
F : +1 (514) 697-2090
E : ventes@exova.com
W: www.exova.com

Certificate of Analysis

Request number:	**13-577001**
Date Received:	2013-12-13
Date Certificate Issued:	2013-12-23
Certificate Version:	3

☑ Official Certificate of Analysis

☐ Preliminary Certificate of Analysis

Client

MAXXAM ANALYTIQUE INC.

2690, avenue Dalton
Québec, Québec, Canada
G1P 3S4
Telephone : (418) 658-5784
Fax : (418) 658-6594

P.O. Number	Your project ID.	Project Manager
NA	B381001	Mme Martine Bergeron

Comments

Version 3: English certificate requested by the client.

This version replaces and cancels all earlier version.

NA : Information Not Available

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Certificate of Analysis

Client: **MAXXAM ANALYTIQUE INC.** **Request Number: 13-577001**

P.O. Number	Your Project ID.	Project Manager
NA	B381001	Mme Martine Bergeron

Sample(s)

Lab. No.	**2501751**
Your Reference	X08009-01R\31784
Matrix	Water
Sampled by	M. THÉRIAULT ET T. THOMSON
Site sampled	NA
Date sampled	2013-12-09
Date received	2013-12-13

Parameter(s) Method Reference		
Resultats toxicite truite	Preparation	-
QE006-01 (Accredited)	Analysis	-
	Sequential No.	NA
LC50-96h	% v/v	NA
% mortality at 100% v/v	% mort 96h	0
CI 95% lower		NA
CI 95% upper		NA
Code Statistical method		NA
Toxic units	U.T.	NA
Conclusion		Not lethal
Analysis details		APPENDIX

Comments:

2501751 X08009-01R\31784 Trout - Test type : Single concentration

Note 1: Results and comments, if any, relate only to samples submitted for analysis at the Saint-Augustin-de-Desmaures laboratory.

Stephan Veilleux, biologist