-FINAL-

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

Submitted to:

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Mineral Development Division
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January 2007

TF6126508

EXECUTIVE SUMMARY

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by the Department of Natural Resources, Mineral Development Division (DNRMD), in June 2006, to conduct a Phase II Environmental Site Assessment (ESA) at the Former Rambler Consolidated Mine Property located off Highway 414, approximately 15 km east of the Town of Baie Verte, Newfoundland and Labrador (NL), herein referred to as the Site. The assessment was requested as a follow-up to a Phase I ESA completed for the Site in March 2005. The purpose of this investigation was to collect the necessary information to confirm the presence / absence of environmental contamination as a result of concerns identified at the Site as presented in the Phase I ESA report.

For reporting purposes, the Site was divided into the following seven areas:

- Area A: Raymo Processing Facility;
- Area B: East Mine;
- Area C: Big Rambler Pond Mine;
- Area D: Tailings Area;
- Area E: Rambler Main Mine (Mining Lease 145);
- Area F: Bunkhouse Area (Mining Lease 145); and
- Area G: Acid Generating Access Roads.

Please note that since the completion of the Phase I ESA, Mining Lease 145 (Rambler Main Mine and Bunkhouse Area) has been returned to the Crown, however all buildings and structures are not the property of the Crown and have been excluded from this investigation.

Based on the findings of the Phase I ESA and an initial site inspection carried out by AMEC on June 22, 2006, AMEC designed and carried out a Phase II ESA sampling program at the Site that included the collection of asbestos, paint, swab, soil, groundwater, surface water, sediment, waste rock and tailings samples for select chemical analyses. The Phase II ESA sampling program was carried out at the Site during the period of September 6 to 13, 2006.

Findings of the asbestos sampling program revealed that asbestos was detected in the drywall joint compound and exterior siding (west side) of Building No.2 at the East Mine. Asbestos fibres in drywall joint compound and exterior siding are considered to be “non-friable”, unless disturbed.

Findings of the paint sampling program revealed the presence of lead containing paints at both the East Mine and the Raymo Processing Facility. The concentration of lead leachate (5.29 mg/L) detected in one paint sample (EM-PS7) collected at the Site exceeded the provincial guideline for leachable toxic waste[1] and the federal regulation for the Transportation

[1] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

of Dangerous Goods (TDG) for lead (5.0 mg/L). Paint sample EM-PS7 consist of grey on green paint collected from the mechanical equipment inside Building No.2 of the East Mine Site. In the absence of further consideration (i.e. dilute with substrate), this paint, if removed from the Site, must be disposed of as a hazardous material.

Findings of the swab sampling program revealed that the swab sample (EM-SWAB) collected from the surface of an oil-stained metal pan located inside the polychlorinated biphenyl (PCB) Storage Area of Building No.2 at the East Mine contained PCBs. Therefore, the metal pan must be treated as a hazardous material and cannot be disposed of without appropriate decontamination. Alternatively, the pan may be disposed of at an approved hazardous materials treatment facility.

Findings of the soil sampling program revealed the presence of: metal, cyanide and acid impacts at the Raymo Processing Facility; metal impacts at the East Mine; and petroleum hydrocarbon, metal and cyanide impacts at the Rambler Main Mine. Based on the testing completed, no PCB or polycyclic aromatic hydrocarbon (PAH) impacted soil was detected at the Site through the current investigation. Please note that no soil sampling was carried out at the Big Pond Rambler Mine during the current investigation.

Findings of the groundwater sampling program revealed the presence of: toluene, metal and acid impacts at the Raymo Processing Facility; metals, cyanide, fluoride and acid impacts at the Rambler Main Mine; and metal, cyanide and acid impacts at the Tailings Area. Please note that no groundwater samples were collected at the East Mine, Big Pond Rambler Mine and the Bunkhouse Area during the current investigation.

Findings of the surface water sampling program revealed the presence of metal and acid impacts all on-Site water bodies sampled during the current investigation. It is important to note that the value of pH (4.35) detected in surface water leaving the property (i.e. South Brook near Route 414) was well below the applicable CCME Freshwater Aquatic Life (FAL) guideline of 6.5 to 9.0. This indicates off-Site migration of acidic waters from the Site into the aquatic environment of South Brook and possibility other downgradient freshwater and marine habitats.

Findings of the sediment sampling program revealed the presence of metal and acid impacts at all on-Site water bodies sampled during the current investigation. It is also important to note that the concentration of total cyanide detected in sediment sample RPF-SED1 (31.4 mg/kg), collected from the holding pond (i.e. vats) at the Raymo Processing Facility exceeded the CCME Canadian Environmental Quality Guideline (CEQG) of 8.0 mg/kg for cyanide in soil at an industrial site. Therefore, in the event that the processing facility is to be decommissioned, special consideration must be given to treatment/disposal of the sediments within the holding pond.

Based on the testing completed during the current investigation, it is evident that potential acid generating (PAG) waste rock and tailings are present throughout the Site. It is evident that PAG waste rock was used in the construction of the various roadways present throughout the Site.

The PAG waste rock and tailings present at the Site were not buried or covered at the time of the current investigation, but exposed the elements, air and water. Given these conditions, waste rock and tailings present at the Site will likely continue to produce acid and therefore have an impact on the surrounding environment.

Based on the findings of the Phase II ESA, AMEC indicates the following Phase III ESA requirements for the Site at this time:

Raymo Processing Facility

- Re-sample monitoring well RPF-MW1 and install two additional monitoring wells to delineate the toluene impacts identified in groundwater in the vicinity of monitoring well RPF-MW1; and
- Excavate six additional test pits at the former cyanide drum storage area to delineate the vertical and horizontal extent of cyanide impacted in soil at this area of the Site.

Rambler Main Mine

- Excavate four additional test pits to delineate the vertical and horizontal extent of TPH contaminated soil identified adjacent to the generator and two 910 L ASTs present on the east side of the mill building;
- Excavate four additional test pits to delineate the vertical and horizontal extent of cyanide contaminated soil identified along the west side of the mill building;
- Install three additional boreholes/monitoring wells at the Site to delineate the extent of cyanide impacted groundwater identified in the vicinity of monitoring well RMM-MW1;
- In the event that ownership of the Site buildings is transferred to the Province of Newfoundland and Labrador, a Hazardous Materials Assessment (HMA) should be implemented at the Site to identify any additional environmental concerns and hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required). In the meantime, special consideration should be given to securing or proper removal and disposal of all chemicals being stored within the PCB and Reagent Storage Area of the mill building and the chemical laboratory present at the Site;
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
- In the event that the pad-mounted and pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

Bunkhouse Area

- Install a minimum of three boreholes/monitoring wells to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- The UST identified on the southwest corner of Bunkhouse No.2 and the discarded UST identified in the woods approximately 20 m south of the Staff House should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations;
- In the event that ownership of the Site buildings is transferred to the Province of Newfoundland and Labrador, a HMA should be implemented at the Site to identify any additional environmental concerns and hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required); and
- In the event that the pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

Based on the findings of the Phase II ESA, AMEC does not recommend that any Phase III ESA activities for the East Mine, Tailings Area, Big Rambler Pond Mine and the Access Roads at this time. However, please note that additional environmental sampling and/or monitoring requirements, for all areas of the Site, may be required in the event that any future development and/or decommissioning activities are planned for the Site.

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APPENDICES

1.0 INTRODUCTION

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by the Department of Natural Resources, Mineral Development Division (DNRMD), in June 2006, to conduct a Phase II Environmental Site Assessment (ESA) at the Former Rambler Consolidated Mine Property located off Highway 414, approximately 15 km east of the Town of Baie Verte, Newfoundland and Labrador (NL), herein referred to as the Site (refer to Figures 1.1 and 1.2, Appendix A-1). The assessment was requested as a follow-up to a Phase I ESA completed for the Site in March 2005.

The purpose of this investigation was to collect the necessary information to confirm the presence / absence of environmental contamination as a result of concerns identified at the Site as presented in the Phase I ESA report. Also, since the completion of the Phase I ESA, Mining Lease 145 (Rambler Main Mine and Bunkhouse Area) has been returned to the Crown, however all buildings and structures are not the property of the Crown and have been excluded from this investigation. To assess the presence / absence of environmental concerns at Mining Lease 145, a Phase I ESA walkover survey of the exterior property was completed by AMEC prior to proceeding with any Phase II ESA activities at that area of the Site. Also, since the ground surfaces of the property were snow covered at the time of the Phase I ESA, a preliminary site walkover of all areas of the Site investigated at the time of the Phase I ESA was also carried out prior to the completion of any Phase II ESA activities at the Site.

For reporting purposes, the Site was divided into the following seven areas:

- Area A: Raymo Processing Facility;
- Area B: East Mine;
- Area C: Big Rambler Pond Mine;
- Area D: Tailings Area;
- Area E: Rambler Main Mine (Mining Lease 145);
- Area F: Bunkhouse Area (Mining Lease 145); and
- Area G: Acid Generating Access Roads.

1.1 SITE DESCRIPTION

As indicated above, all seven areas of the Site were assessed during the current investigation. Please note that since all Site buildings present at Mining lease 145 (Rambler Main Mine and Bunkhouse Area) are not property of the Crown, these structures were not assessed at the time of the site inspection. The assessment of Mining Lease 145 was limited to the exterior property. A general description of each of these areas is presented in this section.

1.1.1 Area A: Raymo Processing Facility

The Raymo Processing Facility is located directly southeast and adjacent to the Tailings Area (refer to Figure 1.3, Appendix A-1 and Photo 1, Appendix B-1). The facility consists of rock crushing equipment, a conveyer belt system, holding pond (i.e. vats), screening equipment, a storage tower tank and a partially enclosed structure housing electrical utilities. Most structures at the facility are rusty, collapsed and in a condition of disrepair.

In 1998, Raymo Processing Limited operated a cyanidation leaching process at the Site in an attempt to recover gold contained within the tailings present at the Site. The project was unsuccessful and its operations ceased in 1999. The tailings generated during gold extraction processing at the Site have been stockpiled at an area located less than 100 m northeast of the facility. Other features present at the Site include an area of buried debris located directly south of the facility and a former equipment and cyanide drum storage area located along a narrow roadway, directly southwest of the facility.

1.1.2 Area B: East Mine

The East Mine Site is located approximately 1.5 km east of the Rambler Main Mine and consists of an open mine shaft and two existing buildings (refer to Figure 1.4, Appendix A-1 and Photos 2 and 3, Appendix B-1). Debris (wood, metal, etc.) is present on the ground surface throughout the Site.

Building No.1 is considered to be a safety hazard as part of the roof structure has collapsed under the weight of crushed ore left on top of the building and the entire building leans to one side, undermining its structural stability. Located at one end of the building is a small open hole accessing what is assumed to be the mine shaft.

Building No. 2 is considered to be a safety hazard and contains old sample containers, rusty drums and several pieces of machinery historically used at the Site for hoisting activities. One area of the building was once historically used for PCB storage, however documentation suggests that all PCB containing materials previously storage at the Site have been removed. Two former aboveground storage tanks (AST) holding cradles and a high pressure air tank were observed at the rear of the building (west side).

Former Building No.3 exists as a remaining concrete slab foundation.

1.1.3 Area C: Big Rambler Pond Mine

The Big Rambler Pond Mine is located adjacent to Big Rambler Pond, approximately 2 km southeast of the Rambler Main Mine and consists of an open pit and access road (refer to Figure 1.5, Appendix A-1 and Photo 4, Appendix B-1). The open pit was full of reddish colour water at the time of the Site visit, an indicator of acid rock drainage (ARD) impacts. A small stream extends in a northwest direction from the open pit into the waters of Big Rambler Pond,

located approximately 100 m of the open pit. This stream also appeared to be impacted by ARD. Piles of potential acid generating (PAG) waste rock were piled around the edges of the pit and scattered throughout the surrounding area. Metal debris, consisting of aluminum siding and two haulage truck boxes were observed northeast of the open pit. Several seasonal cottages are located in the immediate vicinity of the Site.

1.1.4 Area D: Tailings Area

The main feature at this area of the Site is a large mass of tailings, approximately 1.5 km long x 0.5 km wide, subaerially exposed in the Rambler Pond Basin (refer to Figure 1.6, Appendix A-1 and Photos 5 and 6, Appendix B-1). Other features present at the tailings area include a tailing pond, two spillways, two diversion ditches and associated roadways (north and west), a monitoring station, Muskrat Pond, Little Rambler Pond and Beaverhouse Pond.

1.1.5 Area E: Rambler Main Mine (Mining Lease 145)

The Rambler Main Mine Site is located approximately 500 m east of the Raymo Processing Facility and consists of 14 main structures: mill building, crusher building, chemistry laboratory, maintenance garage, storage shack, hoist building, storage shed, core shack, refueling station, security shed, weigh scales, main office building, pumphouse and a storage rack (refer to Figure 1.7, Appendix A-1 and Photo 7, Appendix B-1). As outlined above, these structures are not property of the Crown and therefore were excluded from this investigation. The generator house of the mill building was viewed as part of this investigation to confirm the presence of two 910 L ASTs. In an attempt to identify potential environmental concerns within the Site buildings, AMEC also viewed the interior of several other structures (i.e. storage shack, maintenance building, chemical laboratory, office building, etc.) through open doors and window, where possible, from the exterior.

1.1.6 Area F: Bunkhouse Area (Mining Lease 145)

The Bunkhouse Area is located approximately 200 m south of the Main Mine and consists of four main structures; a cookhouse, two bunkhouses and a staff housing unit (refer to Figure 1.8, Appendix A-1 and Photo 8, Appendix B-1). All buildings were considered to be a safety hazard at the time of the Site visit. As outlined above, these structures remain the property of Ming Minerals Limited and therefore were excluded from this investigation. In an attempt to identify potential environmental concerns within the Site buildings, AMEC viewed the interior of the structures through open doors and window, where possible, from the exterior.

1.1.7 Area G: Access Roadways

Reportedly, potential acid generating (PAG) waste rock from the mining operations was used for grading and construction of all access roadways connecting the different mining areas throughout at the Site. For the purposes of this investigation the access roads were divided into the following roadways (refer to Figure 2, Appendix A-1):

- Main Access Road (MAR);
- Alternate Access Road (AAR);
- East Mine Access Road (EMR);
- Big Pond Rambler Access Road (BRP); and
- Tailings Access Road (TAIL).

1.2 BACKGROUND INFORMATION

Various operators explored the Rambler property intermittently from 1905 to 1953. No work was carried out at the Site from 1954 to 1960. Consolidated Rambler Mines Limited obtained the rights to the property in 1961 and production of a copper concentrate began at the Site in 1964. A total of 4.3 million tonnes of ore was mined and milled and approximately 3.8 million tonnes of sulphide tailings remain on the Site. In 1987, the Rambler property was declared Exempt Mineral Land, with the mineral and surface rights returning to the Crown.

From 1995 to November 1996, Ming Minerals Limited mined from the Ming West and Rambler Main mines. The ore was concentrated at the Rambler Main Mine Mill. During the summer of 1996, a cyanide circuit was added to the mill for processing gold. The mill shut down in January 1997, but remains the property of Ming Minerals Limited.

In 1998, Raymo Processing Limited operated a cyanidation leaching process in an attempt to recover gold contained within the Rambler tailings. The project was unsuccessful and ceased operations in 1999.

Two mining leases existed for portions of the Rambler Mine area during the Phase I ESA and were excluded from that study: Mining Lease 145 held by Ming Minerals Limited which included the area of Rambler Main Mine and Mill; and Mining Lease 141 which is currently held by 51190 Newfoundland and Labrador Inc. and contains the former Ming Main and Ming West Mine. Exploration activities are on-going within Mining Lease 141 by Altius Minerals Corporation. The area encompassing Mine Lease 145 (Main Mine and Bunkhouse Area) has been included in this investigation, while the area encompassing Mining Lease 141 has been excluded.

1.2.1 Findings of Phase I ESA

A review of the Phase I ESA completed at the Site in March 2005 revealed the following potential environmental concerns at the Site:

- The regulatory review uncovered details of impacts to water courses downstream of the Tailings Area, including South Brook (refer to Figure 6, Appendix A-1). Studies conducted by Environment Canada indicated that concentrations of metals and low pH in discharge waters from the Tailings Pond are acutely lethal to fish;
- Paint was noted as peeling from structures at the Raymo Processing Facility, East Mine and Tailings Area. These paints may contain lead and mercury;

- PCBs were historically stored within Building No. 2 at the East Mine Site. A sampling program implemented at the Site in 2003 indicated that an area of soil within Building No. 2 was impacted with PCBs (130 mg/kg). Also, several swabs taken from within the former PCB Storage Area of Building No.2 at the East Mine Site indicated impacts to the floor and walls of the structure;
- Staining was noted inside both buildings present at the East Mine Site; however staining on the exterior of the buildings was not ascertained due to the snow cover conditions. Staining observed within the PCB Storage Area of Building No.2 have been tested in previous studies and indicate that the stain areas contain PCBs. Since concrete is considered porous in nature, the concrete slab floor of the building may also be impacted with PCBs;
- Potential asbestos siding was noted on Building No. 2 at the East Mine Site. Potential asbestos based piping and elbows were noted at the Raymo Processing Facility. Appropriate precautions should be taken when removing and disposing any potential asbestos containing siding;
- Numerous drums were noted near the Raymo Processing Facility. These drums were found empty and did not contain labels. A large rusting drum containing an unknown substance was found in the sample storage room of Building No. 2 at the East Mine Site;
- Several structures on-Site are built with acid generating waste rock from the mining operations. Uses of the waste rock include, but are not limited to, construction of roads connecting the mining sites, construction of dykes and general Site grading;
- Hazardous chemicals, including but not limited to cyanide, copper sulfate and zinc sulfate, were used at the Raymo Processing Facility. Storage or these chemicals continued on site after the facility was abandoned and were removed from the Site in 1999; and
- A potential abandoned aboveground storage tank (AST) was noted at the Raymo Processing Facility. The tank was not accessible during the investigation, and as such its contents and/or purpose could not be determined.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation, consisting of a series of test pits and monitor wells and the subsequent collection of soil, groundwater, surface water and sediment samples was recommended to assess the presence / absence of environmental impacts at the Site.

1.3 OBJECTIVES

The specific objectives of this report, as identified in the RFP dated May 2006, include the following:

- Perform the necessary Phase I ESA activities at the former Mining Lease 145 Area of the Site (excluding all Site buildings) that was excluded from the previous Phase I ESA completed for the Site in March 2005;
- Conduct an initial site inspection to verify surface conditions that could not be examined during the previous Phase I ESA due to snow cover;

- Develop and implement a detailed Phase II ESA sampling program to confirm the presence / absence of contamination present at the Site;
- Prepare a final list of petroleum storage tanks, in the area to be assessed, to be removed under a separate contract as per the 2003 Storage and Handling of Gasoline and Associated Products Regulations; and
- Provide a detailed report outlining the methodologies, findings, conclusions and recommendations of the investigation.

The limitations of this work are provided in Appendix D-1.

1.4 REGULATORY FRAMEWORK

The federal and provincial governments have various Acts and Regulations in place to regulate and control the release of contaminants to the environment. The primary legislation relevant to the investigation of contaminants and contaminated sites include the following:

- Canadian Environmental Protection Act;
- Fisheries Act; and
- Newfoundland Environment Protection Act.

Each of these Acts and associated Regulations have a direct bearing on the classification of contaminants and the measures to be taken when a contaminant is released to the environment in an unacceptable quantity.

The various governments in Canada (federal and provincial), the Canadian Standards Association (CSA) and the Canadian Council of Ministers of the Environment (CCME) have prepared and/or adopted numerous guidelines, policies, and procedures related to protection of the environment and the investigation of potentially contaminated sites. Several of these documents are listed below:

- CSA Z768-01 Phase I Environmental Site Assessments, CSA (revised 2001);
- CSA Z769-00 Phase II Environmental Site Assessment, CSA (2000);
- National Guidelines for Decommissioning Industrial Sites, CCME (1991);
- Subsurface Assessment Handbook for Contaminated Sites, CCME (1994);
- Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites Volumes I and II, CCME (1993);
- Technical Assistance Bulletins (TAB) 1-29, Environment Canada (1989-1995);
- Atlantic RBCA (Risk Based Corrective Action) Reference Documentation for Petroleum Impacted Sites, Version 2.0, Atlantic Partnership in RBCA Implementation (PIRI - October 2003);

- Government of Newfoundland and Labrador Guidance Document for the Management of Impacted Sites, December 2004, Version 1.0;
- Guidance Manual for Developing Site-Specific Soil Quality Remediation Objectives for Contaminated Sites in Canada (1996); and
- Canadian Environmental Quality Guidelines (CEQG), CCME (revised 2004).

AMEC has considered all of the above in conducting the investigative activities described in this report.

1.4.1 Selection of Applicable Environmental Quality Guidelines/Standards

The Site is considered to be industrial based on past and projected future Site use activities. Site soils are considered to be coarse-grained and groundwater resources are not used for human consumption and therefore considered to be non-potable.

Asbestos sample analyses results were compared to the "1998 Newfoundland and Labrador Asbestos Abatement Regulations (Nfld. Reg. 111/98). Under these regulations, materials containing greater than 1% asbestos fibers are considered asbestos-containing and should be managed in accordance with the applicable regulations.

Paint samples were compared to the Federal Hazardous Products Act (HPA) criteria which have recently been set to new, lower acceptable levels for lead in paints for exposure. Under the Act, the lead content limit has been reduced from 5,000 mg/kg to 600 mg/kg for surface coating materials used in or around the home or other premises where children or pregnant women may become exposed. The new limit for lead in paint came into effect on April 19, 2005 and is used to assess the potential for human health concerns associated with lead in paint. This new limit of 600 mg/kg was used for this property to assess lead concentrations in paint. Since it is the intention of the DNRMD to demolish the Site buildings and infrastructure, in areas where the lead concentrations exceed 600 mg/kg, special health and safety measures should be taken during demolition.

In order to determine disposal options, should disposal be required, the former Federal HPA criteria of 5,000 mg/kg lead in paint is typically used to determine whether or not the paint chip samples would be submitted for a leachate analysis. Paint chip samples that contain less than 5,000 mg/kg are not likely to be leachable and therefore may be disposed of at an approved landfill facility, pending regulatory approval. This was confirmed with Ms. Marie Ryan of the Newfoundland and Labrador Department of the Environment and Conservation (NLDOEC). Paint samples with lead concentrations in excess of 5,000 mg/kg were subjected to leachability testing during this program. The provincial guideline for leachable toxic waste[2] and the federal regulation for the Transportation of Dangerous Goods (TDG) for lead (5 mg/L) were used to

[2] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

assess the results of the leachability testing to determine disposal options for any lead-containing paint to be removed during renovations/demolition of painted surfaces at the Site.

The Federal HPA was used to evaluate mercury concentrations in paint. The maximum acceptable concentration of mercury in paint, under the HPA, is 0.001 percent (equivalent to 10 mg/kg) in or around the home or other premises where children or pregnant women may become exposed. In areas where the mercury concentration exceeds 10 mg/kg, measures should be taken to ensure that the paint is encapsulated or removed.

In order to determine disposal options, should disposal be required, concentrations of mercury in paint were also compared to the CCME-Canadian Environmental Quality Guidelines (CEQGs) for mercury in soil at a commercial site (24 mg/kg). Paint samples that contained a mercury concentration in excess of 24 mg/kg were subjected to leachability testing. The provincial guideline for leachable toxic waste[1] and the federal regulation for the TDG for mercury (0.10 mg/L) were used to assess the results of the leachability testing to determine disposal options for any mercury-containing paint removed during renovations/demolition of painted surfaces at the Site.

The CCME-CEQG for PCB in soil at a commercial/industrial site (33 mg/kg) was used to evaluate PCB concentrations in paint. In areas where the PCB concentration exceeds 33 mg/kg, measures should be taken to ensure that the paint is encapsulated or removed. Paint samples that contained a PCB concentration in excess of 33 mg/kg should be subjected to leachability testing. The federal regulation for the TDG for mercury (0.3 mg/L) was used to assess the results of the leachability testing to determine disposal options for any PCB-containing paint removed during renovations/demolition of painted surfaces at the Site.

There are no available Provincial guidelines for the comparison of PCB in swab samples; therefore, for comparison purposes, results were compared to the United States Environmental Protection Agency (U.S. EPA) guideline of 10 ug/100 cm^2 for PCB transformers destined for metal recycling, based on its 1987 PCB Spill Clean-up Policy (40 CFR 761.12). This U.S. EPA guideline has been adopted by many Canadian Provinces.

The analytical results for benzene, toluene, ethylbenzene and xylene (BTEX) in soil were compared to the CCME-CEQGs (revised 2005) for industrial sites and the 2003 Atlantic PIRI Tier I Risk Base Corrective Action (RBCA) Risk Based Screening Levels (RBSLs) for commercial sites with coarse-grained soil and non-potable groundwater. Analytical results for modified total petroleum hydrocarbon (TPH) in soil were compared to the 2003 Atlantic PIRI Tier I RBCA RBSLs for commercial sites with coarse-grained soil and non-potable groundwater. Please note that the 2003 Atlantic PIRI Tier I RBCA RBSLs are human health based guidelines and therefore are not protective of ecological receptors. Since there are several potential sensitive ecological habitats (i.e. wetlands habitats, aquatic habitats, forest habitats, etc.) in close proximity to the Site, the CCME-CEQGs should be applied when assessing potential ecological impacts at the Site. A RBCA Tier I Checklist for Ecological Receptor Assessment is attached in Appendix C-1.

Soil analytical results for metals plus hydrides, PAHs, PCBs, cyanide and pH were compared to the CCME-CEQGs (revised 2005) for industrial sites.

Criteria from the CCME-CEQG (revised 2005) for the protection of Freshwater Aquatic Life (FAL) were used to assess surface water and groundwater quality for benzene, toluene, ethylbenzene, metals, PAHs, pH, cyanide and phenols. Since CCME-FAL does not list criteria for xylene and TPH, the 2003 Atlantic PIRI Tier I RBSLs, Version 2.0, for commercial sites with coarse-grained soil and non-potable groundwater were used to assess the concentrations of these two parameters in groundwater.

Freshwater sediment sample analytical results for metals, PCBs and PAHs are compared to the CCME-CEQGs. The Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments were used to evaluate the sediment quality. There are no guidelines to assess the concentration of petroleum hydrocarbons (BTEX/TPH) and cyanide and the value of pH in sediment. BTEX/TPH and cyanide in sediment were assessed based on presence / absence. Values of pH in sediment were assessed based on acidic, neutral and/or basic conditions.

1.5 METHODOLOGY

The methodologies used to conduct the field investigations and collection of asbestos, paint, soil, concrete, swab, groundwater, sediment and surface water samples are described in this section.

1.5.1 Paint Sampling Program

Samples were collected from painted surfaces present at the Site by cutting and scraping areas of flaking paint using clean knives and scrapers. Samples were collected down to bare substrate (i.e. concrete, wood, etc.). A minimum of five grams (where possible) of paint was obtained from each sampling location and stored in Ziploc™ plastic bags. A total of 10 paint samples were collected at the Site during the current investigation.

1.5.2 Asbestos Sampling Program

Samples were collected by removing a 2.0 cm by 2.0 cm piece of material (where possible) from suspect asbestos containing building materials and placing them into Ziploc™ plastic bags. Sampling locations which contained potentially friable asbestos materials were sealed with duct tape adhesive after the completion of sampling. A total of three asbestos samples were collected at the Site during the current investigation.

1.5.3 Concrete Sampling Program

Concrete samples were collected by using a 10-pound sledge-hammer to break pieces of concrete from the slab-on-grade concrete floor of Building No.2 at the East Mine. All concrete samples were placed in pre-cleaned laboratory supplied sample glass containers and stored in coolers with ice for shipment to the laboratory. Once received by the laboratory, the concrete samples were crushed into powder form prior to analyses. A total of three concrete samples were collected at the Site during the current investigation.

1.5.4 Swab Sampling Program

One swab sample was collected from the surface of an oil-stained metal pan located inside the PCB Storage Area of Building No. 2 at the East Mine Site was analyzed for PCBs. The sample was collected using a prepared PCB swab provided by the analytical laboratory and swabbing over a 100 cm^2 area. The sample was placed inside pre-cleaned laboratory supplied sample container and stored inside a cooler with ice for shipment to the laboratory.

1.5.5 Test Pit Soil Sampling Program

The test pit soil sampling program was carried out on September 6 to September 13, 2006 and consisted of excavating a total of 76 test pits at various locations throughout the Site. Test pits were excavated using a track mount excavator owned and operated by Barkers Construction Limited. Several surface soil samples, collected in the vicinity of pole mounted and pad mounted transformers identified at the Site, were excavated using a stainless steel spade to a nominal depth of 0.3 below the ground surface (bgs).

Soil samples were collected at 1.0 m intervals (where possible) during excavation. All soil samples were placed in pre-cleaned laboratory supplied sample containers and stored in coolers with ice for shipment to the laboratory. Duplicate soil samples, for field screening, were collected at all sample locations and transferred to 0.5 L Ziploc™ freezer bags. The samples were geologically logged by experienced AMEC staff.

1.5.6 Borehole Soil Sampling Program

The borehole soil sampling program consisted of advancing a total of 10 boreholes at various locations throughout the Site on September 6 to September 8, 2006. Boreholes were drilled by using a CME 55 track mounted drill rig, owned and operated by Newfoundland Environmental Services (NES). The boreholes were drilled using 125 mm inside diameter hollow stem augers. Boreholes were advanced to depths ranging from 3.0 m to 7.3 m bgs. Monitoring wells were installed in all 10 boreholes advanced at the Site during the current investigation.

Continuous soil samples were collected from boreholes at 0.6 m intervals (where possible) during performance of Standard Penetration Tests (SPTs) using a 50 mm diameter split spoon sampler. A stainless steel spatula was used to remove the soil samples from the split spoon

sampler. The split spoon sampler and spatula were washed with biodegradable soap, followed by a clean water rinse, between all sampling events. Soil stratigraphy, sample recovery, SPT blow counts, monitoring well construction details and groundwater levels were record by experienced AMEC staff.

1.5.7 Soil Vapour Headspace Screening

Field screening consisted of measuring soil vapour headspace (SVH) concentrations of volatile organic vapours in clear plastic bags 1/3 filled with site soils. The SVH concentrations were measured with a hand-held (HNU DL101) photo ionization detector (PID) calibrated to a benzene referenced isobutylene standard. Prior to analysis, the soil samples were warmed to room temperature for 30 minutes and then shaken to enhance volatilization. The headspace measurement was taken by inserting the tip of the sampling instrument into the bag without contacting the soil or the side of the bag. The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

1.5.8 Monitoring Well Installation and Development

Monitoring wells were installed in all 10 boreholes advanced at the Site. The monitoring well materials consisted of 50 mm diameter PVC flush threaded pipe and screen, which arrived at the Site pre-cleaned and factory wrapped in plastic. These materials were handled with disposable surgical gloves, after being unwrapped. The screened interval was installed such that it straddled the water table. Solid riser pipe was added from the top of the screened interval to ground surface. In all cases at least 0.5 m of solid riser pipe was used at the surface to ensure surface water or bentonite did not enter the well. The screened portion of each well was packed with silica sand to fill the annular space around the screen, to a level of approximately 0.3 m above the screen. A bentonite seal was placed above the screen and the remainder of the void was filled with sand to just below the ground surface.

To provide security and to prevent any entry of foreign material, the tops of the monitoring wells (PVC riser pipe) were capped using lockable J-Plugs. To protect the top of the well, a steel stick-up and/or flush mount casings was placed over each well.

The monitoring wells were developed using dedicated WaTerra^{TM} hand pumps to remove a minimum of 10 well volumes of water from each well.

1.5.9 Groundwater Sampling Program

Groundwater samples were collected from the 10 newly installed monitoring wells and three existing standpipes (i.e. MW1, MW3 and MW4) present at the Site. Prior to sampling, the monitoring wells were purged by removing three additional well volumes of groundwater from each well. During purging, the pH, temperature and specific conductance of the groundwater being removed from the wells were monitored to ensure that representative samples of groundwater were collected. Prior to purging the wells, the pH and specific conductance meters

were calibrated according to the manufacturer's instructions. These calibrations were re-checked periodically during and at the end of each day to ensure that no significant drifting of the instrument calibration had occurred.

The groundwater samples were placed in laboratory supplied amber glass containers and vials, maintained in cool storage with ice and submitted to the laboratory for select chemical analyses. Groundwater samples for metals analyses were filtered in the field.

1.5.10 Gauging Wells for Groundwater and Free Phase Hydrocarbon Levels

All monitoring wells present at the Site were gauged using a Heron oil/water interface meter to determine static groundwater elevations and free phase petroleum hydrocarbon product (if present). Gauging was conducted by lowering the clean probe down the wells until a tone was obtained indicating a liquid had been contacted. The probe was raised until the tone ceased and by very slowly lowering the probe, the depths at which the tones for a non-aqueous liquid and/or water were first sounded were then carefully noted to the nearest millimeter. The water level was allowed to equilibrate for at least a period of approximately 48 hours after the installation was completed and prior to recording water and free phase hydrocarbon levels.

1.5.11 Surface Water Sampling Program

The surface water sampling program consisted of collecting a total of 18 surface water samples from various freshwater bodies and water courses located throughout the Site on September 6 and 12, 2006. Samples were collected directly into pre-cleaned lab supplied sample bottles from a depth of approximately 0 to 10 cm below the water surface. The surface water samples were collected either from the shoreline or from an aluminum boat, depending upon water depth and access.

1.5.12 Sediment Sampling Program

The sediment sampling program consisted of collecting a total of 14 sediment samples from various freshwater bodies and water courses located throughout the Site on September 6, 9 and September 12, 2006. The program consisted of collecting surface sediments (0.0 – 0.30 m) using both an aluminum boat and ponar grab sampler or a stainless steel spade from the shoreline, depending upon water depth and access.

The ponar grab sampler was positioned at the desired location and allowed to advance through the water column and into the bottom at a uniform and quick rate of descent. The sampler was then gently retrieved back to the surface. The sediment samples were then sub-divided as necessary and stored in precleaned laboratory-supplied jars, maintained in cool storage with ice and submitted to the laboratory for select chemical analyses. Both the ponar sampler and spade were cleaned in ambient water before and after each use and a new pair of disposable latex gloves was used at each sampling point to prevent sample cross-contamination.

1.5.13 Waste Rock and Tailings Sampling Program

The waste rock and tailings sampling program consisted of collecting a total of 23 waste rock samples from various locations (i.e. four from each of the five access roads, two at Big Rambler Pond Mine and one at East Mine) and four tailings samples from the Tailings Area on September 11 and 12, 2006. Waste rock samples that exhibited evidence of iron-staining, white/yellow precipitates, sulphide, pyrite, etc. were collected in clear plastic bags and tailings samples were collected at a depth of 0 – 0.3 m below the ground surface (bgs) using a stainless steel samples and stored in precleaned laboratory-supplied glass jars. All waste rock and tailings samples were submitted to the laboratory for Acid Base Accounting (ABA) analysis using the Modified Sobek Method.

1.5.14 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27.

1.5.15 Laboratory Analytical Program

The AMEC Earth & Environmental analytical laboratory in Mississauga, Ontario was used to conduct the paint, asbestos, swab, concrete, soil, sediment, surface water and groundwater sample analyses for the project. The laboratory meets the requirements of ISO/IEC Guide 25 (General Requirements for the Competence of Calibration and Testing Laboratories), and is an accredited member of the Canadian Association for Environmental Analytical Laboratories (CAEAL). Research and Productivity Council (RPC) laboratory in Fredericton, New Brunswick was used to conduct the Acid Base Accounting analyses for waste rock and tailings samples collected during the project. The detailed laboratory analytical program is outlined in Table 1-1 below.

Table 1-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Area A: Raymo Processing Facility		
Paint	RPF-PS1, RPF-PS2	Lead and Mercury
	RPF-PS1	PCB
	RPF-PS1	Lead Leachate (TCLP)
Soil	RPF-TP1-SS2, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP8-SS3, DUP1	BTEX/TPH
	RPF-TP2-SS4, RPF-TP6-SS1	PCB

Media	Sample ID	Analyses
Soil	RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1, RPF-TP8-SS3, DUP2	Metals Plus Hydrides
	RPF-TP6-SS1	PAH
	RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1, RPF-TP8-SS3, RPF-TP9-SS1	Total Cyanide
	RPF-TP5-SS3, RPF-TP8-SS3	pH
Groundwater	RPF-MW1	BTEX/TPH, Metal Plus Hydrides, General Chem. and Total Cyanide
Surface Water	RPF-SW1, RPF-SW2	Metals Plus Hydrides, General Chem. and Total Cyanide
Sediment	RPF-SED1	Metals Plus Hydrides, Total Cyanide and pH
Area B: East Mine		
Paint	EM-PS1, EM-PS2, EM-PS3, EM-PS4, EM-PS5, EM-PS6, EM-PS7	Lead and Mercury
	EM-PS1	PCB and PCB Leachate (TCLP)
	EM-PS3, EM-PS4, EM-PS7	Lead Leachate (TCLP)
Asbestos	EM-ASB1, EM-ASB2, EM-ASB3	Asbestos
Concrete	EM-CONC 1, EM-CONC 2, EM-CONC 3	PCB
Swab	EM-SWAB	PCB
Soil	EM-TP2-SS1, EM-TP3-SS1, EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, EM-TP14-SS1, EM-TP15-SS1, DUP 8	BTEX/TPH
	EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, DUP 10	Metals Plus Hydrides
	EM-TP2-SS1, EM-TP3-SS1	Lead
	EM-TP8-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1	PAHs
	EM-TP1-SS1, EM-TP4-SS1, EM-TP5-SS1, EM-TP6-SS1, EM-TP7-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, EM-TP15-SS1, EM-TP16-SS1, DUP 9	PCBs
Waste Rock	EM-WR1	Acid Base Accounting
Area C: Big Rambler Pond Mine		
Surface Water	BRP-SW1, BRP-SW2	Metals Plus Hydrides and General Water Chemistry
Sediment	BRP-SED1	Metals Plus Hydrides and pH
Waste Rock	BRP-WR1, BRP-WR2, DUP-2	Acid Base Accounting
Area D: Tailings Area		
Paint	TAIL-PS1	Lead and Mercury
Soil	TAIL-TP1	PCB

Media	Sample ID	Analyses
Groundwater	TAIL-MW1, TAIL-MW2, TAIL-MW3, MW1, MW3, MW4, DUP E	Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Sediment	TAIL-SED1, TAIL-SED2, TAIL-SED2, TAIL-SED4, TAIL-SED5, TAIL-SED6, TAIL-SED7, TAIL-SED8, LRP-SED1, DUP A	Metals Plus Hydrides, Total Cyanide and pH
Surface Water	TAIL-SW1, TAIL-SW2, TAIL-SW3, TAIL-SW4, TAIL-SW5, TAIL-SW6, TAIL-SW7, TAIL-SW8, TAIL-SW9, TAIL-SW10, TAIL-SW11, LRP-SW1, LRP-SW2, LRP-SW3, DUP D	Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Tailings	TAIL-TL1, TAIL-TL2, TAIL-TL3, TAIL-TL4	Metals Plus Hydrides, Total Cyanide, pH and Acid Base Accounting
Area E: Rambler Main Mine		
Soil	RMM-TP1-SS2, RMM-TP2-SS2, RMM-TP3-SS2, RMM-TP4-SS1, RMM-TP5-SS1, RMM-TP6-SS1, RMM-TP7-SS2, RMM-TP10-SS1, RMM-TP11-SS2, RMM-TP12-SS1, RMM-TP13-SS2, RMM-TP14-SS1, RMM-TP15-SS1, RMM-TP16-SS1, RMM-TP17-SS3, RMM-TP18-SS2, RMM-TP19-SS1, RMM-TP20-SS4, RMM-TP21-SS3, RMM-TP22-SS1, RMM-TP23-SS3, RMM-TP24-SS3, RMM-TP25-SS1, RMM-TP26-SS1, RMM-TP27-SS1, RMM-TP28-SS2, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP31-SS1, RMM-TP32-SS1, RMM-TP33-SS1, RMM-TP34-SS1, RMM-MW6-SS3, DUP 3, DUP 6, DUP 7	BTEX/TPH
	RMM-TP1-SS2, RMM-TP16-SS1, RMM-TP17-SS3, RMM-TP19-SS1, RMM-TP26-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP32-SS1, DUP 12	Metals Plus Hydrides
Soil	RMM-TP5-SS1, RMM-TP11-SS2, RMM-TP14-SS1, RMM-TP15-SS1, RMM-TP21-SS3, RMM-TP23-SS3, RMM-TP24-SS3	Lead
	RMM-TP5-SS1, RMM-TP14-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP32-SS1, DUP 5	PAHs
	RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP35-SS1, RMM-TP36-SS1, RMM-TP37-SS1, RMM-TP38-SS1, RMM-TP39-SS1, DUP C	PCBs
	RMM-TP3-SS2, RMM-TP5-SS1, RMM-TP6-SS1, RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP9-SS1, RMM-TP11-SS2, RMM-TP13-SS2, RMM-TP16-SS1, RMM-TP18-SS2, DUP 4, DUP 11	Total Cyanide
Groundwater	RMM-MW1, RMM-MW2, RMM-MW3, RMM-MW4, RMM-MW5, RMM-MW6	BTEX/TPH, Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Sediment	RMM-SED-1, RMM-SED-2, RMM-SED-3	BTEX/TPH, Metals Plus Hydrides, PAHs and PCBs

Media	Sample ID	Analyses
Area F: Bunkhouse Area		
Soil	BH-TP1-SS2, BH-TP2-SS1, BH-TP3-SS1, BH-TP4-SS1, BH-TP5-SS2, BH-TP6-SS1, BH-TP7-SS1, BH-TP8-SS1, BH-TP9-SS2, BH-TP10-SS2, BH-TP12-SS1, BH-TP1-SS2, BH-TP1-SS2, DUP B	BTEX/TPH and Lead
	BH-TP11-SS1, BH-TP13-SS1	PCB
Area G: Access Roadways		
Waste Rock	EMR-WR1, EMR-WR2, EMR-WR3, EMR-WR4 TAIL-WR1, TAIL-WR2, TAIL-WR3, TAIL-WR4, MAR-WR1, MAR-WR2, MAR-WR3, MAR-WR4, ARR-WR1, ARR-WR2, ARR-WR3, ARR-WR4, BRP-WR3, BRP-WR4, BRP-WR53, BRP-WR6, DUP-1	Acid Base Accounting

1.5.16 Quality Assurance/Quality Control Program

QA/QC samples were analyzed for approximately 10% of the total samples analyzed. A total of 19 field duplicate samples (DUP 1 to DUP 12, DUP A to DUP E and DUP-1 and DUP-2) were submitted to the laboratory during the field program for select chemical analyses. The Quality Assurance/Quality Control (QA/QC) results are reported on the Laboratory Certificates of Analyses and discussed in detail in Section 13.0.

In order to minimize cross contamination during sampling, a field QA/QC program was followed, which included the following measures:

- Latex gloves were worn during all sampling (i.e. new pair of gloves for each sample);
- All soil sampling equipment was thoroughly cleaned and rinsed with distilled water prior to sampling to ensure that samples were unaffected by cross-contamination from previous samples;
- Dedicated WaTerra^{TM} tubing was used for each monitoring well to sample groundwater in order to ensure that samples were unaffected by cross-contamination from previous samples;
- Pre-cleaned laboratory supplied jars and bottles were used to collect soil and groundwater samples; and
- Samples were stored in a cooler with ice to prevent freezing while onsite and to keep cool during shipment to the laboratory.

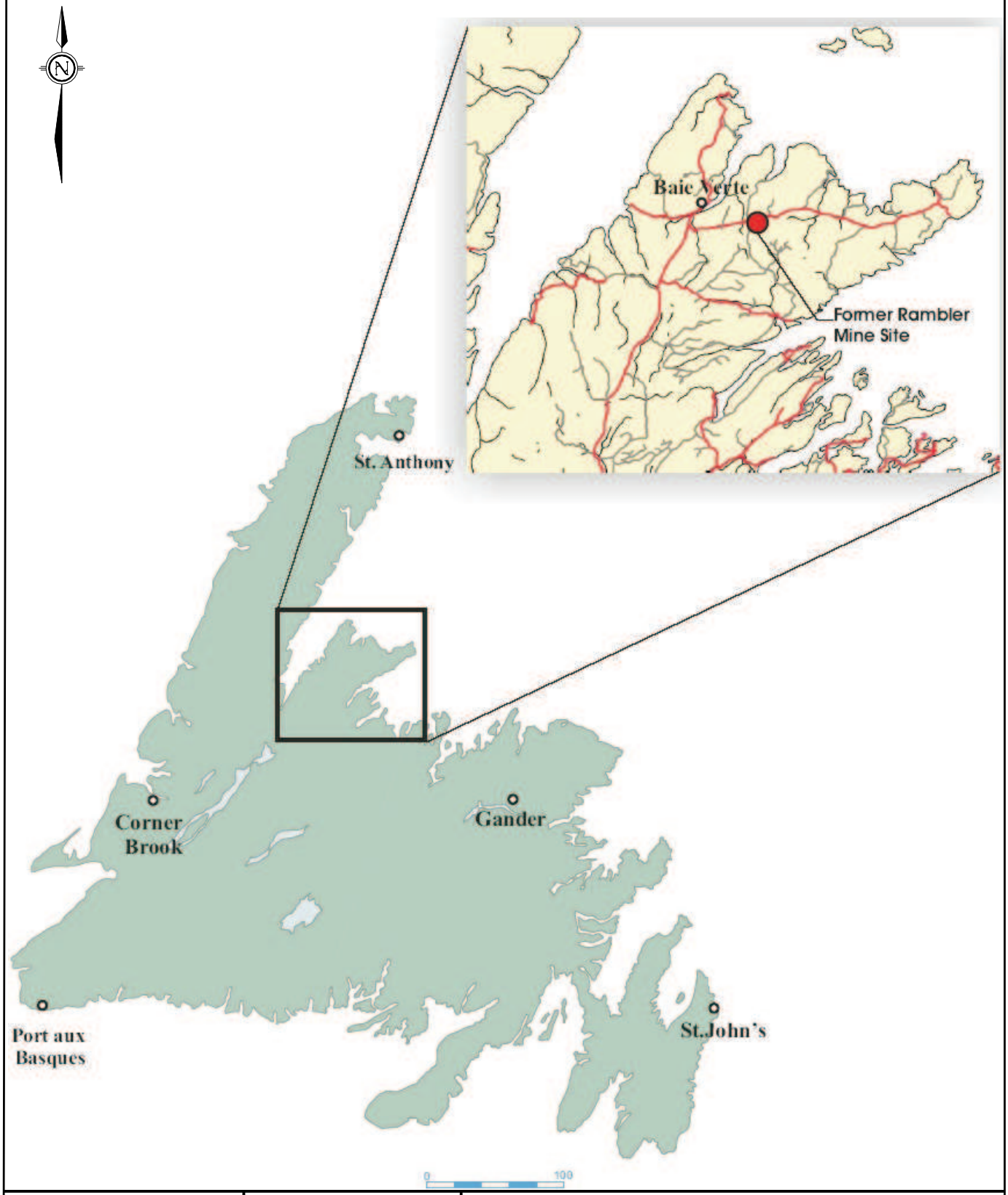
The AMEC Laboratory has an extensive QA/QC program in place to ensure that reliable results are consistently obtained. Specific laboratory QA/QC measures include:

- Chain of Custody and sample integrity inspection;
- Strict documentation control and files;

- Trained personnel prepare and analyze samples according to Standard Operating Procedures;
- All analytical methods are based on accepted (i.e. MOE, US EPA, ASTM) Procedures and are fully validated prior to use;
- Precision is monitored by performing replicate analysis of samples within each batch;
- Accuracy is verified by analyzing spiked samples and reference materials within each batch;
- Instrument calibration integrity is ensured by analyzing calibration check standards within each run sequence;
- Matrix effects in organic analyses are assessed with surrogate fortification of each sample;
- Extensive use is made of reference material for routine procedure evaluation;
- Highest available purity analytical standards;
- Predefined analytical sequences ensure all results are traceable to calibration and QC data;
- Hard copy reports displaying all of the required data are generated for each instrument;
- Analytical results are determined only from instrument responses that fall within the calibration range;
- Acceptable QA/QC performance must be demonstrated prior to data authorization (data are subject to three levels of QA/QC review: chemist, supervisor and manager);
- On-going method and instrument performance records are maintained for all analyses;
- Records containing all pertinent data are securely archived for three years; and
- A full-time Quality Assurance Scientist evaluates the QA/QC program on an on-going basis.

APPENDIX A-1

Figures



NOTES:

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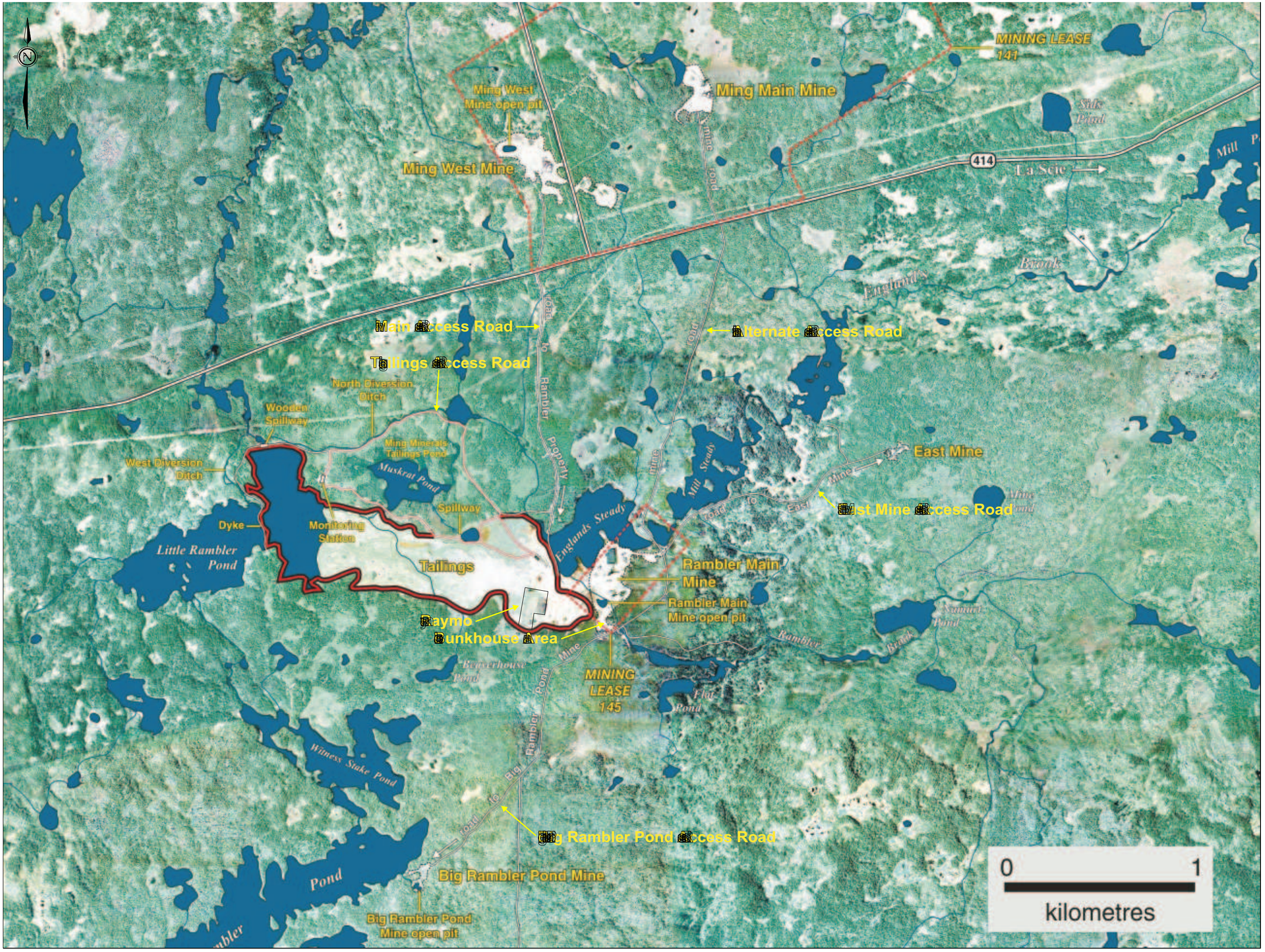
DEPARTMENT OF NATURAL RESOURCES

DRAWN: J. Young	PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT FORMER CONSOLIDATED RAMBLER MINE PROPERTY, BAIE VERTE, NL.
CHECKED: G. Warren	DRAWING: SITE LOCATION PLAN

FILE NO.	SCALE	DATE	FIG. NO.	REV.
TF 6126508	NTS	January 2007	1.1	



NOTES

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DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

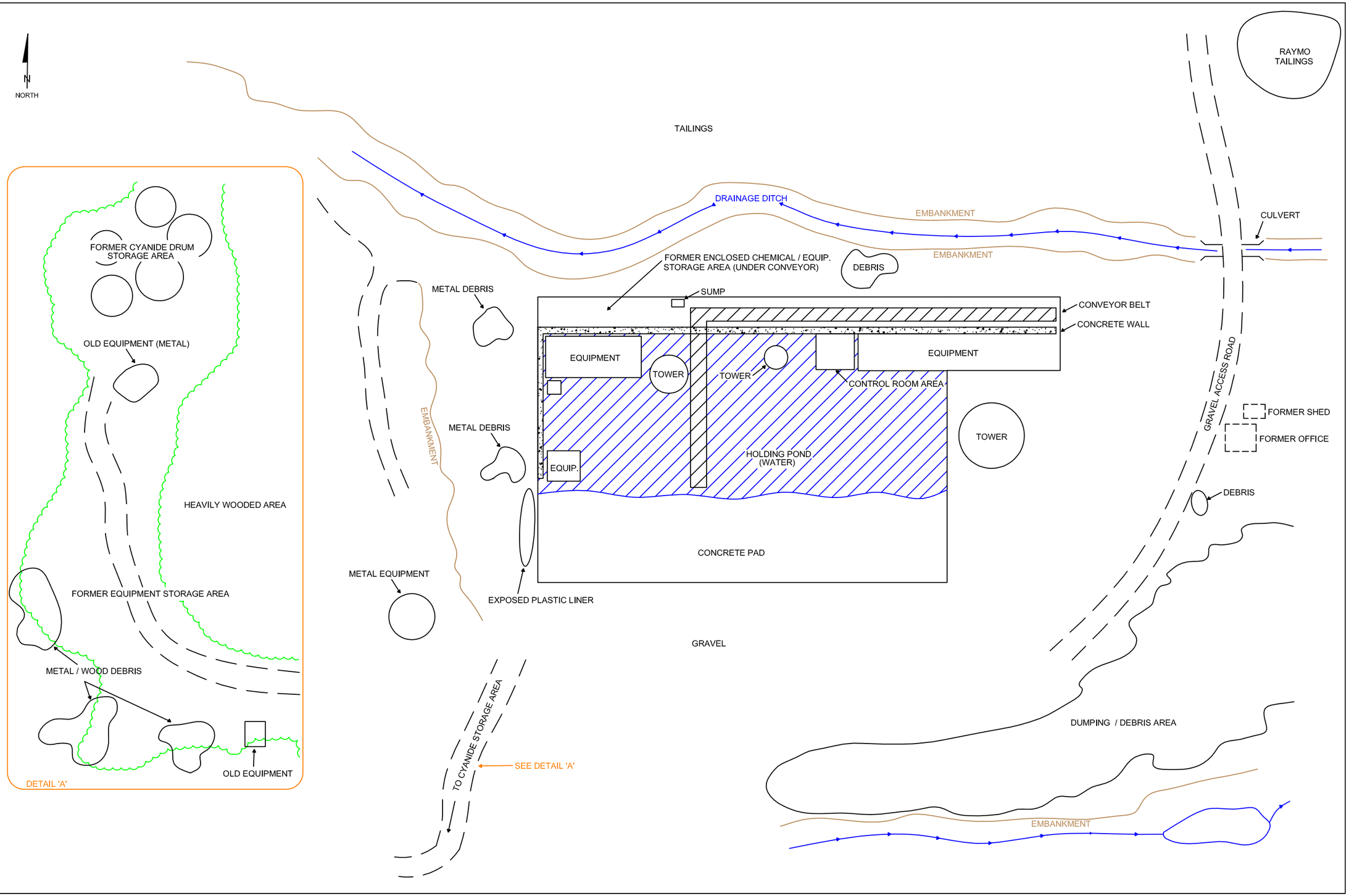
DRAWING TITLE

DETAILED SITE LOCATION PLAN

SCALE	PROJECT NUMBER
N.T.S.	TF 6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE No:	DATE	REV
1.2	January 2007	



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LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY

CLIENT

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PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAYMO PROCESSING FACILITY

SCALE	PROJECT NUMBER
NTS	TF6126508

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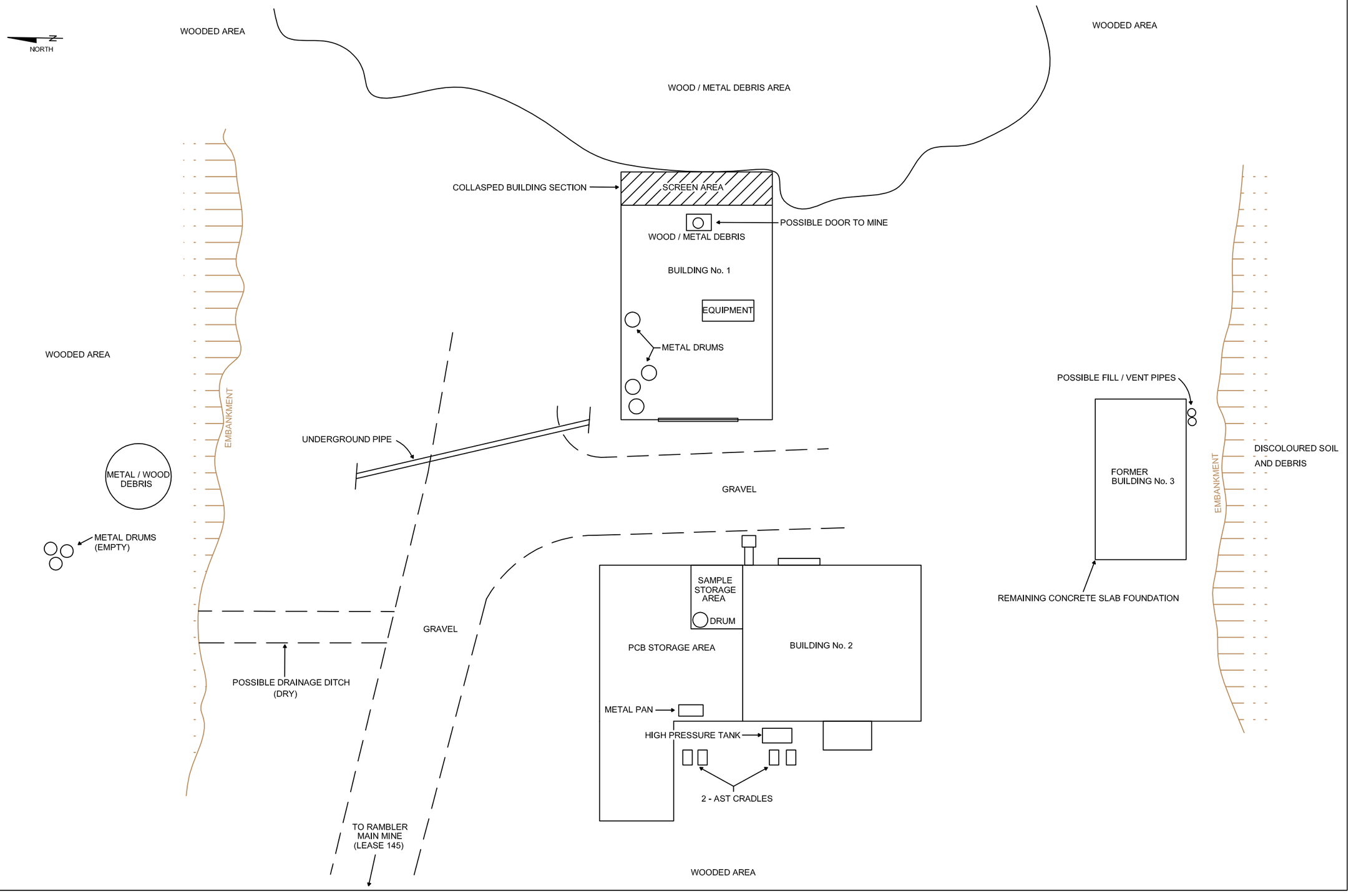
J. Young	G. Warren	

FIGURE NO.	DATE	REV
1.3	January 2007	



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LEGEND

TREE LINE

GRAVEL ACCESS ROADS

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

EAST MINE SITE

SCALE	PROJECT NUMBER
NTS	TF6126508

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J. Young	G. Warren	

FIGURE NO.	DATE	REV
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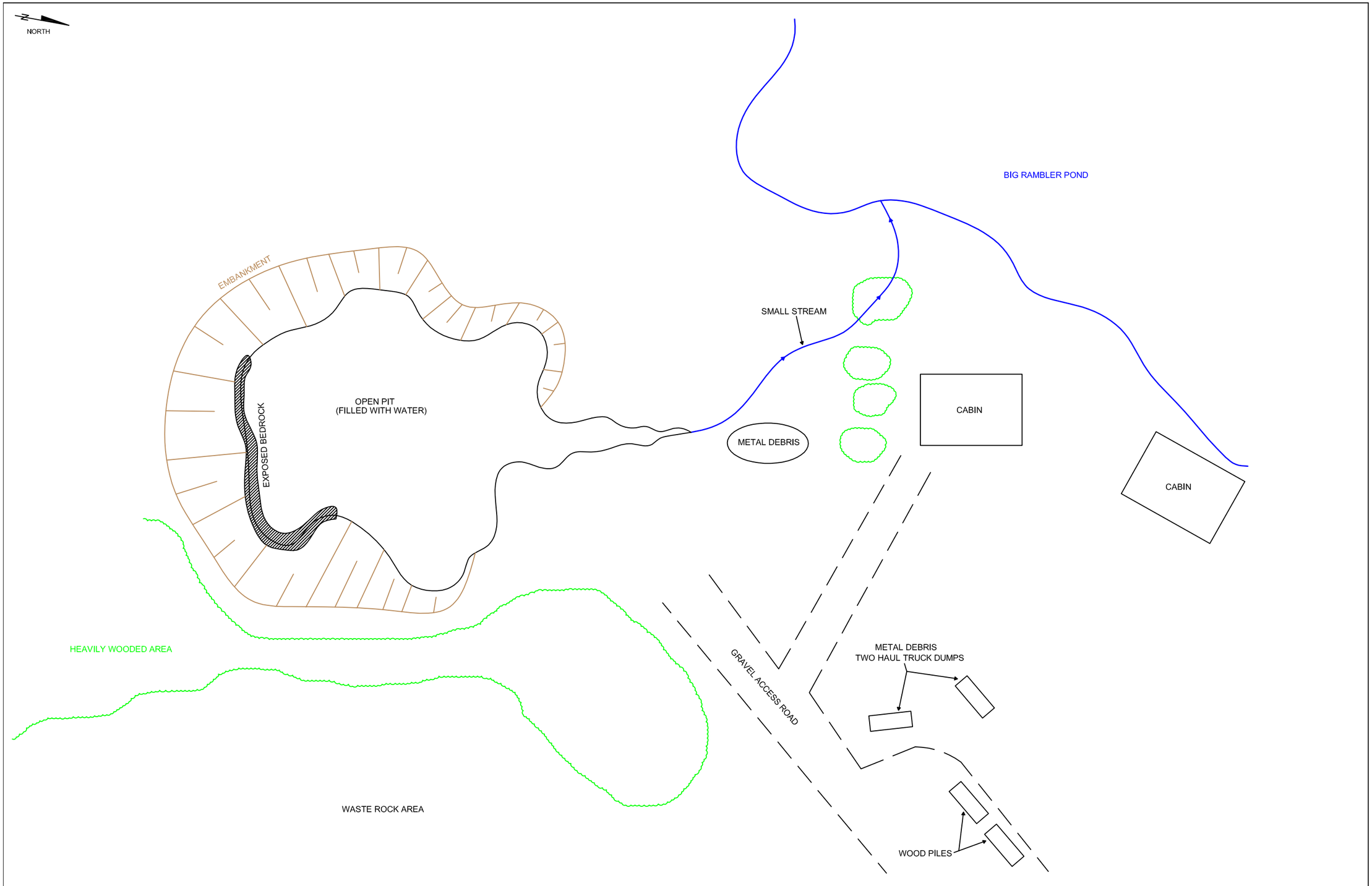

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LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY

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PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

BIG RAMBLER POND MINE

SCALE	PROJECT NUMBER
NTS	TF6126508

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FIGURE NO.	DATE	REV
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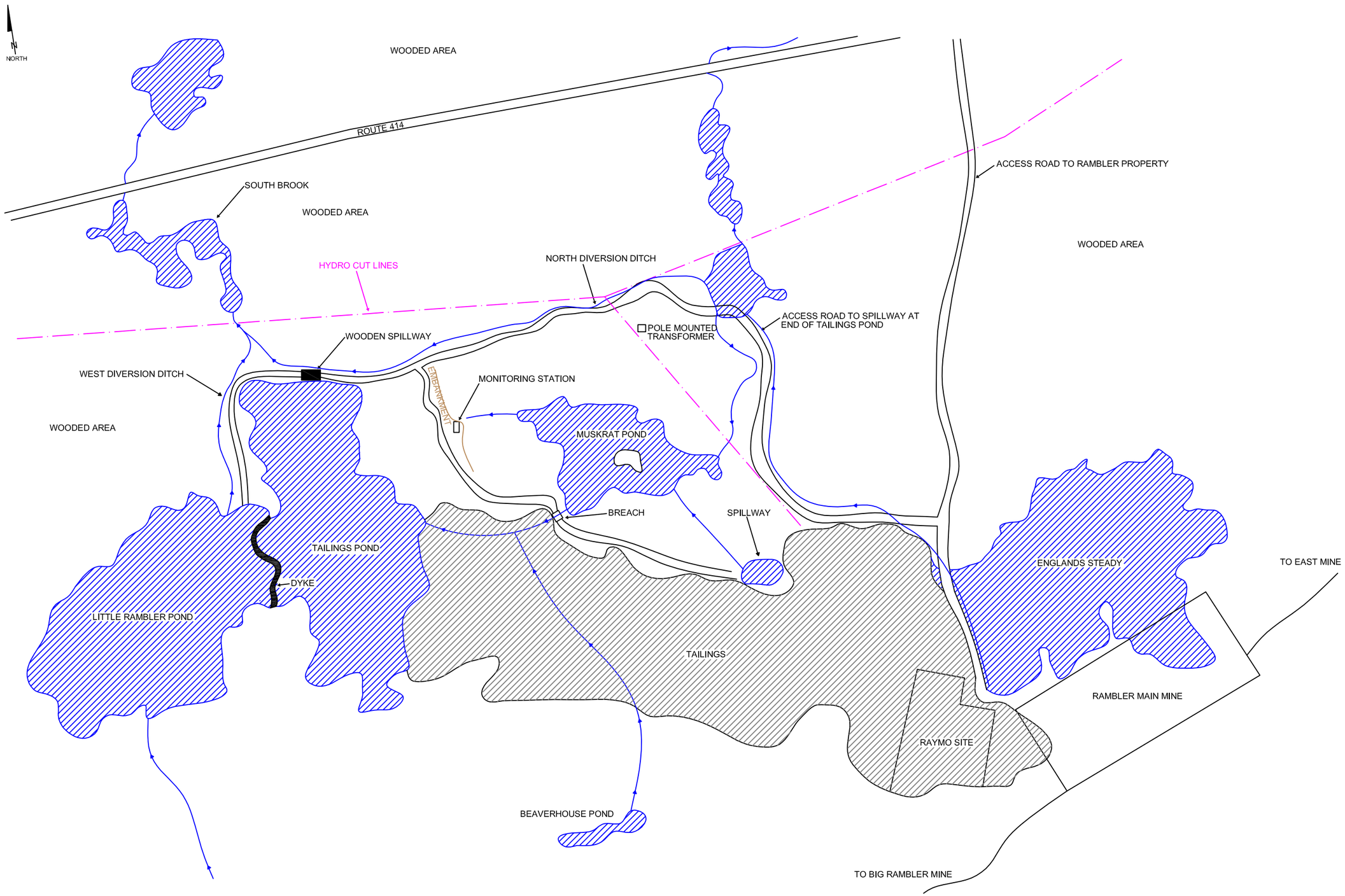

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LEGEND

GRAVEL ACCESS ROADS

STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

TAILINGS AREA

SCALE	PROJECT NUMBER
NTS	TF6126508

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FIGURE NO.	DATE	REV
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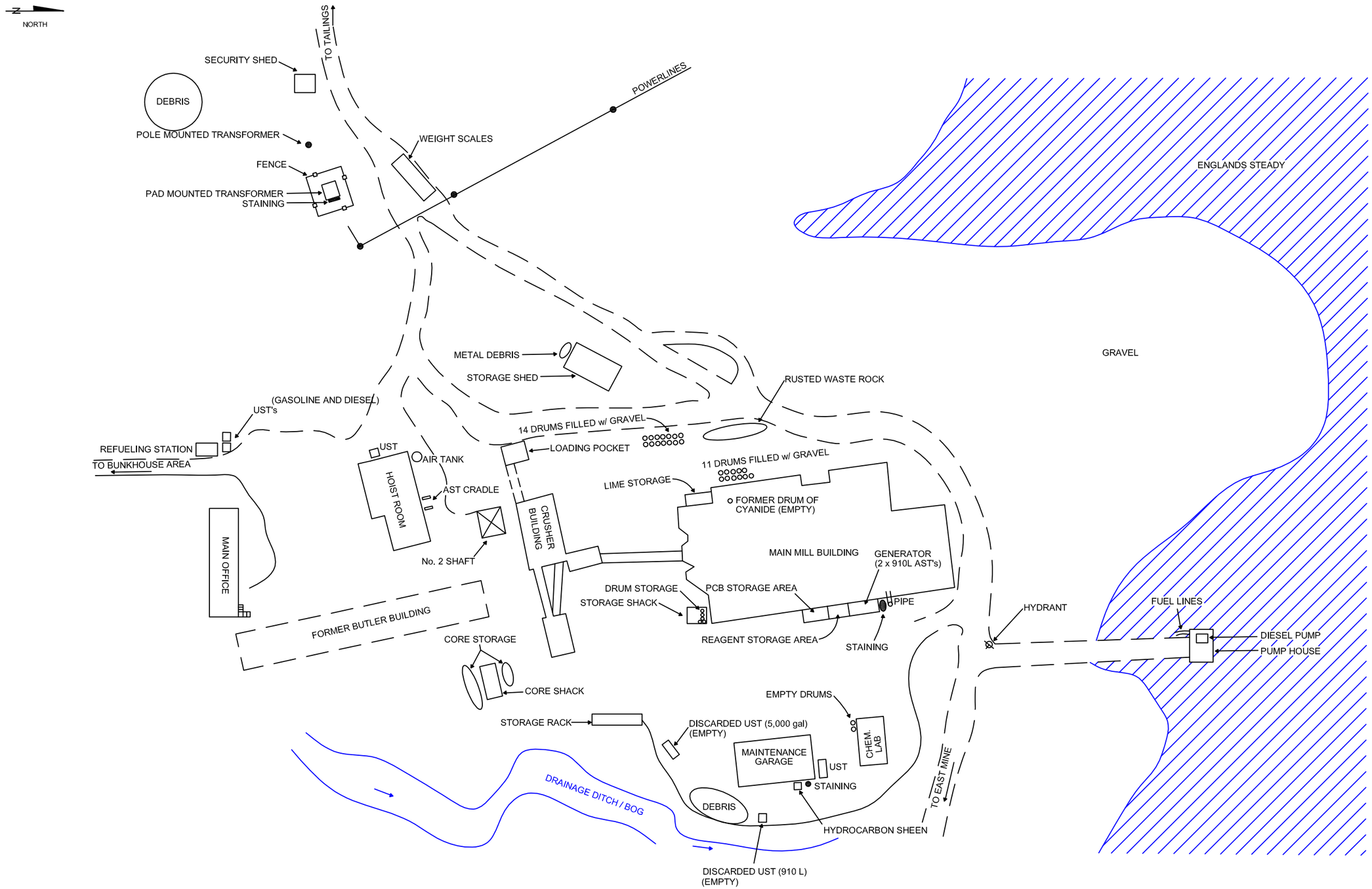

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4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

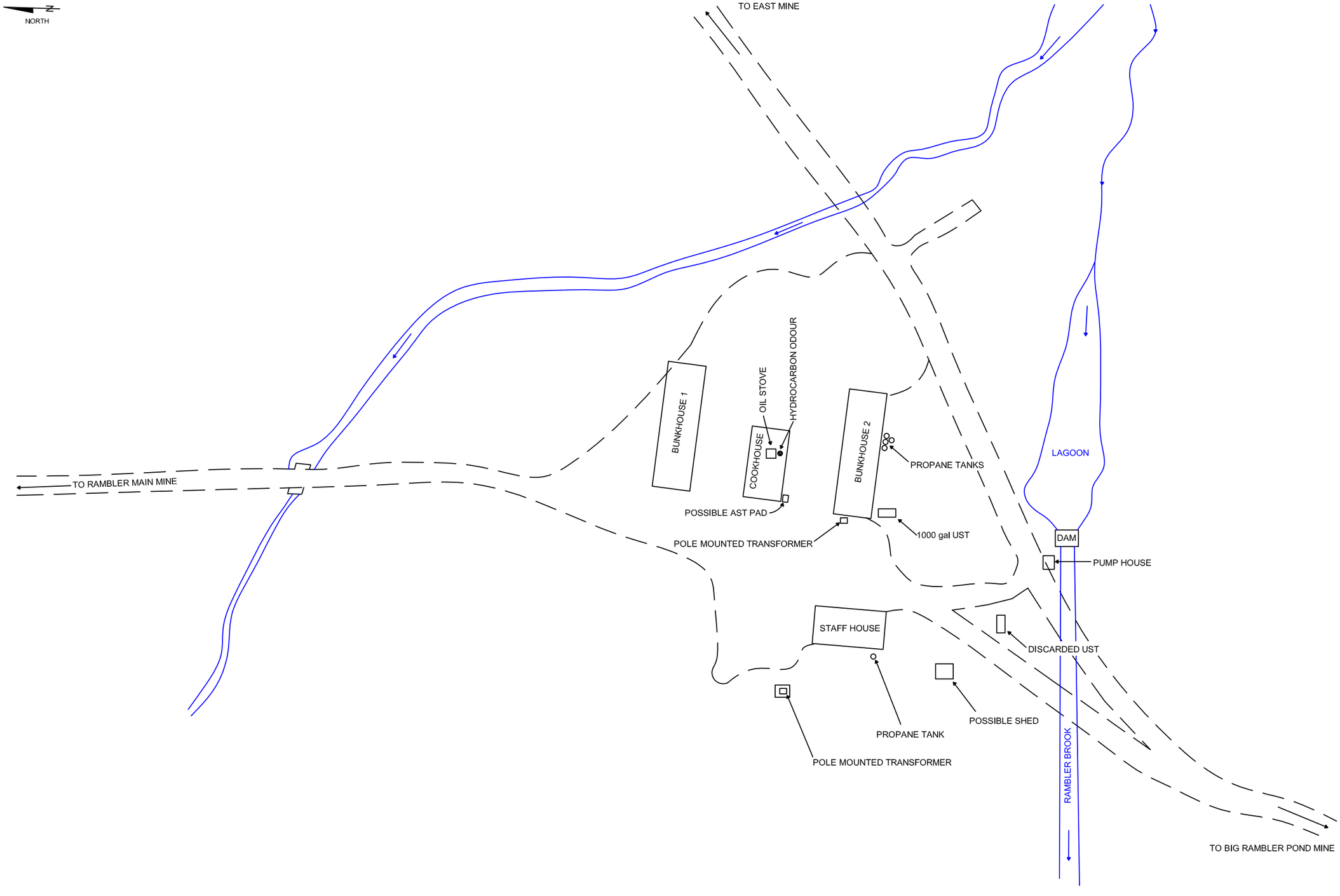
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MAIN MINE

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
1.7	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
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LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MINE BUNK HOUSE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
1.8	January 2007	

APPENDIX B-1

Photographic Record

Photo 1: Raymo Processing Facility.

Photo 2: East Mine – Building No.1.

Photo 3: East Mine – Building No.2.

Photo 4: Big Rambler Pond Mine.

Photo 5: Overview of the Tailings Area.

Photo 6: Wooden Spillway of Tailings Holding Pond.

Photo 7: Rambler Main Mine.

Photo 8: Bunkhouse Area.

APPENDIX C-1

RBCA Tier I Checklist for Ecological Receptor Assessment

APPENDIX 1
Atlantic RBCA Version 2

REFERENCE GUIDELINES TIER ONE CHECK LIST

FOR

ECOLOGICAL RECEPTOR ASSESSMENT

IN ATLANTIC CANADA

ATLANTIC PARTNERS IN RBCA IMPLEMENTATION

June 2003

PURPOSE

This document provides guidance for conducting a TIER 1 screening Ecological Risk Assessment (ERA) at a simple site impacted with hydrocarbons. This is a qualitative evaluation designed to determine whether or not additional data is required to quantify risks to ecological receptors through a tiered Ecological Risk Assessment.
This protocol is to be used in conjunction with the TIER 1 or TIER 2 Human Health Risk Assessment, RBCA tool kit, for Atlantic Canada.

The components of this assessment consist of a check list format to identify the potential receptors at risk and the presence of exposure pathways.

These practices are consistent with the recommended tiered approach from the National Contaminated Sites Remediation Program (NCSRP) as published by Environment Canada

The following guidelines are intended to be the minimum requirements for a preliminary assessment. They should in no way be construed as limiting, if your professional judgment determines that additional or different evaluation is required for a particular site.

INTRODUCTION

The components of this evaluation are divided in two steps. Step 1 identifies presence of ecological receptors on or adjacent to the site, within a suggested distance of about 150 meters. This distance is subject to professional judgment.
Step 2 determines the potential for the ecological receptors to be exposed to release hydrocarbons. Risks to ecological receptors essentially require presence of receptors, potential pathways and presence of toxicity. Further ERA activities should not be required if one of these conditions is missing.

1) ECOLOGICAL HABITAT
(within 150 meters of the site)

YES/NO

- Wetland habitats such as marshes, swamps , tidal flats, beaches Yes
- Aquatic habitats such as rivers, lakes or streams Yes
- Forested habitats (50 acres or more) Yes
- Grassland habitats No
- Provincial/National parks or ecological reserve No
- Rare, threatened or endangered species populations No
- Other critical or sensitive habitat for wildlife, migratory species NO

If the answer is **"NO"** to ALL questions, then no species of concern are identified. There is no further action required.

If the answer to any one question is YES, then proceed to the next step.

2) EXPOSURE ASSESSMENT YES/NO

- Can dissolved hydrocarbons in groundwater reach any receptor habitat identified above now or in the future? Yes
- Can LNAPL (Light Non Aqueous Phase Liquids) reach receptor habitat identified above? Yes
- Can hydrocarbons reach receptor habitat identified above via surface runoffs? Yes

If the site is under building or pavement, skip the next two questions.

- Is there a potential for direct absorption of contaminants through skin? Yes
- Is there a potential for oral consumption of contaminated soils, water, plants? Yes
- Have hydrocarbons, associated by the site being investigated, been known to be present in any of the soils, sediments, surface water of the receptor habitats identified above at concentrations greater than CCME ecologically-based guidelines? Yes

If the answer to any questions above is YES, then further assessment is required. Additional data should be gathered to enhance the knowledge of the site-specific situation such as; fate and transport of contaminants, description of the receptor of concerns, preliminary toxicity estimates and mitigation options. (Tiered ERA)

The results of this screening assessment should be documented in writing in the Atlantic RBCA report. It should detail answers to the questions above and provides documentation or rationale for the answers provided

References;

1) ASTM, RBCA Draft Provisional Standard (RBCA II), Appendix x5 qualitative ecological exposure assessment, ASTM publication, 1997

2) BRITISH COLUMBIA Ministry of Environment, Lands and Parks, 1998. Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia. Landis et al. January 1998.

3) ENVIRONMENT CANADA, 1994, A Framework for Ecological Risk Assessment at Contaminated Sites in Canada: Review and Recommendations. Scientific series No 199., C. Gaudet, EVS Environment Consultants , ESSA Environmental and Social Systems Analysts, Ottawa Ont. 1994

APPENDIX D-1

Report Limitations

LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.
2. The report was prepared in accordance with generally accepted environmental study and/or engineering practices for the exclusive use of the Department of Natural Resources. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.
3. Third party information reviewed and used to develop the opinions and conclusions contained in this report is assumed to be complete and correct. This information was used in good faith and AMEC does not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.
4. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond our control.
5. The objective of this report was to assess environmental conditions at the site, within the context of our contract and existing environmental regulations within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.
6. Our observations relating to the condition of environmental media at the site are described in this report. It should be noted that compounds or materials other than those described could be present in the site environment.
7. The findings and conclusions presented in this report are based exclusively on the field parameters measured and the chemical parameters tested at specific locations. It should be recognized that subsurface conditions between and beyond the sample locations may vary. AMEC cannot expressly guarantee that subsurface conditions between and beyond the sample locations do not vary from the results determined at the sample locations. Notwithstanding these limitations, this report is believed to provide a reasonable representation of site conditions at the date of issue.
8. The contents of this report are based on the information collected during the monitoring and investigation activities, our understanding of the actual site conditions, and our professional opinion according to the information available at the time of preparation of this report. This report gives a professional opinion and, by consequence, no guarantee is attached to the conclusions or expert advice depicted in this report. This report does not provide a legal opinion in regards to Regulations and applicable Laws.
9. Any use of this report by a third party and any decision made based on the information contained in this report by the third party is the sole responsibility of the third party. AMEC will not accept any responsibility for damages resulting from a decision or an action made by a third party based on the information contained in this report.

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APPENDICES

2.0 AREA A – RAYMO PROCESSING FACILITY

2.1 SITE DESCRIPTION

The Raymo Processing Facility is located directly southeast and adjacent to the Tailings Area (refer to Figure 2.1, Appendix A-2 and Photo 1, Appendix B-2). The facility consists of rock crushing equipment, a conveyer belt system, holding pond (i.e. vats), screening equipment, a storage tower and a partially enclosed structure housing electrical utilities. Most structures present at the Site are rusty, collapsed and in a condition of disrepair.

In 1998, Raymo Processing Limited operated a cyanidation leaching facility at the Site in an attempt to recover gold contained within the tailings present at the Site. The project was unsuccessful and its operations ceased in 1999. The tailings generated during gold extraction processing at the Site were stockpiled at an area located less than 100 m northeast of the facility. Other features present at the Site include an area of buried debris located directly south of the facility and a former equipment and cyanide drum storage area located along a narrow roadway, directly southwest of the facility.

2.2 PREVIOUS ENVIRONMENTAL INVESTIGATION – MARCH 2005

The Phase I ESA completed at the Site in March 2005 identified the following potential environmental concerns at the Raymo Processing Facility:

- Hazardous chemicals, including but not limited to cyanide, copper sulfate and zinc sulfate, were historically used at the Site. Storage of these chemicals continued at the Site after the facility was abandoned and were removed in 1999;
- Potential for cyanide/acidic and metals impacts in soil and groundwater near the facility due historical land use activities related to leaching gold from tailings;
- Potential for petroleum hydrocarbon impacts at the Site due to the presence of an abandoned aboveground storage tank (AST) at the Site;
- Potential cyanide/acidic and metals impacts in sediment and surface water within the holding pond (i.e. vats) associated with the Site. Reportedly, the holding pond was backfilled using both clean fill material and tailings;
- Potential lead and mercury-based paint on the processing equipment remaining at the Site; and
- Potential for asbestos containing materials (ACMs) present on the processing equipment remaining at the Site.

Based on the findings of the Phase I ESA, a Phase II ESA, consisting of a series of test pits and monitor wells and the subsequent collection of paint, soil, groundwater, surface water and sediment samples was recommended to assess the presence/absence of environmental impacts at the Site.

2.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with a Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc, Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). The following information and observations were recorded by AMEC at the time of the initial site inspection:

- The tailings produced during operation of the facility were stockpiled in a designated area located less than 100 m northeast of the facility (refer to Figure 2.1, Appendix A-2 and Photo 2, Appendix B-2);
- Due to the reported use of cyanide in gold recovery operations carried out at the Site, the potential exists for the soil, groundwater, surface water, sediment and tailings present at the Site to be impacted with cyanide;
- An area of buried waste/debris was observed approximately 10 m southeast of the processing facility (refer to Figure 2.1, Appendix A-2 and Photo 3, Appendix B-2);
- The AST identified at the Site during the Phase I ESA was determined to be processing equipment and not a fuel storage AST (refer to Figure 2.1, Appendix A-2 and Photo 4, Appendix B-2);
- A former equipment storage area was observed along a narrow roadway located approximately 25 m southwest of the facility (refer to Figure 2.1, Appendix A-2 and Photo 5, Appendix B-2);
- The Site representative identified an area near the end of the narrow roadway, located approximately 100 m southwest of the facility, at which approximately 350 steel drums containing varying amounts of cyanide residue were stored (refer to Figure 2.1, Appendix A-2 and Photo 6, Appendix B-2). All drums were rinsed in the holding pond (i.e. vats), crushed and transported to the Baie Verte Public Landfill for disposal in December 1999;
- A flooded sump was observed along the north edge of the processing facility, directly adjacent and upgradient of a nearby surface water drainage ditch (refer to Figure 2.1, Appendix A-2 and Photos 7 and 8, Appendix B-2). Any spills from this sump would have drained into the adjacent drainage ditch;
- Electrical equipment was observed inside the Control Room located along the northern edge of the processing facility (refer to Figure 2.1, Appendix A-2). This electrical equipment may contain PCBs. The Control Room was in poor condition at the time of the site inspection and not considered safe to access to inspect the types of electrical equipment housed within; and
- No potential ACMs were identified at the Site at the time of the site inspection.

2.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Phase II ESA Proposed Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

2.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting two paint chip samples (RPF-PS1 and RPF-PS2) from the processing equipment present at the Site for lead, lead leachate, mercury and PCB analyses;
- Excavating four test pits (RPF-TP1 to RPF-TP4) along the perimeter of the processing facility and collecting soil samples for BTEX/TPH, metal plus hydrides, total cyanide, pH and PCB analyses;
- Excavating two test pits (RPF-TP5 and RPF-TP8) within the area of buried waste/debris identified at the Site and collecting soil samples for BTEX/TPH, metal plus hydrides, total cyanide and pH analyses;
- Excavating one test pit (RPF-TP6) at the former equipment storage area identified at the Site and collecting soil samples for BTEX/TPH, metal plus hydrides, total cyanide, PCB and pH analyses;
- Excavating one test pit (RPF-TP7) at the former cyanide drum storage area identified at the Site and collecting soil samples for metal plus hydrides and total cyanide analyses;
- Collecting one surface soil sample (RPF-TP9) from the Raymo tailings for total cyanide analysis;
- Installing one borehole/monitoring well (RPF-MW1) near the northwest corner of the processing facility (downgradient) and collecting groundwater samples for BTEX/TPH, general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting one surface water sample (RPF-SW1) from the drainage ditch located north of the processing facility and one surface water sample (RPF-SW2) from the holding pond (i.e. vats) of the processing facility for general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting one sediment sample (RPF-SED1) from the holding pond (i.e. vats) of the processing facility for metal plus hydrides, total cyanide and pH analyses;
- Recording GPS coordinates for all sample locations;
- Surveying the newly installed monitoring well using an oil/water interface probe and recording groundwater depths and free phase petroleum hydrocarbon levels (if present); and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 2.2, Appendix A-2.

2.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater elevations, groundwater flow direction and contaminant observations are discussed in this section.

2.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness brown and reddish brown gravel and sand with some cobbles and trace organics, boulders and fines. A layer black mud/peat type material (i.e. bog) was detected in test pits RPF-TP5 and RPF-TP8 at depths ranging from 0.25 to 0.9 m bgs. Thickness of the soil present at the Site ranged from 0.55 m (RFP-TP4) to at least 3.5 m (RPF-TP2) below the ground surface (bgs). Detailed soil descriptions and sampling depths are provided in the borehole/monitoring well and test pit logs presented in Appendix C-2.

2.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for soil vapour headspace (SVH). SVH readings report the concentrations of volatile organic vapours being released from the soils. SVH readings ranged from 8.8 parts per million (ppm) to 62.9 ppm (refer to Appendix D-2). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

2.4.2.3 Groundwater Conditions

Groundwater Elevations and Flow Direction

The depth to groundwater within monitoring well RPF-MW1 was recorded at 2.86 m bgs. Groundwater was encountered in two (RPF-TP2 and RPF-TP5) of the nine test pits excavated at the Site at depths of ranging from 1.0 m (RPF-TP5) to 3.2 m (TPF-TP2) bgs. Based on the topography of the Site, groundwater flow has been inferred to be in a northeast to north direction, towards the Tailings Area.

Field pH, Temperature and Specific Conductance

During purging of monitoring well RPF-MW1, the pH, temperature and specific conductance of the groundwater being removed from the wells were monitored to ensure that representative samples of groundwater were collected. Field pH, temperature and specific conductance data are presented in Appendix E-2.

2.4.2.4 Contaminant Observations

Petroleum Hydrocarbon Odour

No petroleum hydrocarbon odours were observed in any of the soil, sediment, surface water and groundwater samples collected at the Site.

Free Phase Petroleum Hydrocarbon Product

Monitoring well RPF-MW1 was gauged using a Heron™ oil/water interface meter to measure the thickness of free phase petroleum hydrocarbon product on the water table at the Site (if present). No free phase petroleum hydrocarbon product was detected in monitoring well RPF-MW1 during the current investigation.

No free phase petroleum hydrocarbon product was detected in any of the test pits excavated at the Site during the current investigation.

2.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix F-2.

2.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Raymo Processing Facility is outlined in Table 2-1 below.

Table 2-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	RPF-PS1, RPF-PS2	Lead and Mercury
	RPF-PS1	PCB
	RPF-PS1	Lead Leachate (TCLP)
Soil	RPF-TP1-SS2, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP8-SS3, DUP 1	BTEX/TPH
	RPF-TP2-SS4, RPF-TP6-SS1	PCB
	RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1, RPF-TP8-SS3, DUP 2	Metals Plus Hydrides
	RPF-TP6-SS1	PAH
	RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1, RPF-TP8-SS3, RPF-TP9-SS1	Total Cyanide
	RPF-TP5-SS3, RPF-TP8-SS3	pH
Groundwater	RPF-MW1	BTEX/TPH, Metal Plus Hydrides, General Chemistry and Total Cyanide
Surface Water	RPF-SW1, RPF-SW2	Metals Plus Hydrides, General Chemistry and Total Cyanide
Sediment	RPF-SED1	Metals Plus Hydrides, Total Cyanide and pH

Notes:
DUP 1 is a blind field duplicate of soil sample RPF-TP6-SS1 for BTEX/TPH analysis
DUP 2 is a blind field duplicate of soil sample RPF-TP6-SS1 for metals plus hydrides analysis

2.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for paint, soil, sediment, surface water and groundwater samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix G-2. Sample locations are presented on Figure 2.2, Appendix A-2 and the Laboratory Certificates of Analyses are presented in Section 13.0.

2.5.1 Paint Sample Results

2.5.1.1 Lead in Paint

A total of two paint samples (RPF-PS1 and RPF-PS2) collected from the painted surfaces of the processing equipment remaining at the Site were submitted to the laboratory for lead analyses. The laboratory results for lead in paint are presented in Table 2-1, Appendix G-2. The results were compared to the Federal HPA criterion of 600 mg/kg and the former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentration of lead detected in paint sample RPF-PS1 (18,400 mg/kg) exceeded both the Federal HPA criterion of 600 mg/kg and the former Federal HPA criterion of 5,000 mg/kg and therefore considered to be lead containing. The concentration of lead detected in paint sample RPF-PS2 (92.2 mg/kg) did not exceed the applicable assessment criteria.

2.5.1.2 Mercury in Paint

A total of two paint samples (RPF-PS1 and RPF-PS2) collected from the painted surfaces of the processing equipment remaining at the Site were submitted to the laboratory for mercury analyses. The laboratory results for mercury in paint are presented in Table 2-2, Appendix G-2. The results were compared to the Federal HPA criterion of 10 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that the concentrations of mercury detected in both paint samples did not exceed the Federal HPA criterion of 10 mg/kg. Results ranged from 0.011 mg/kg (RFP-PS2) to 0.096 mg/kg (RPF-PS1).

Since concentrations of mercury detected in the paint samples RPF-PS1 and RPF-PS2 did not exceed the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), these paints, if removed from the Site, may be disposed of at an approved landfill facility. Therefore, leachability testing for mercury was not carried out on the paint samples.

2.5.1.3 PCB in Paint

One paint sample (RPF-PS1) collected from the painted surfaces of the processing equipment remaining at the Site was submitted to the laboratory for PCB analysis. The laboratory result for PCB

in paint is presented in Table 2-3, Appendix G-2. The analytical result was compared to the CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site.

Results of the paint sampling program revealed that the concentration of PCB (16.6 mg/kg) detected in all paint sample RPF-PS1 (16.6 mg/kg) did not exceed the applicable assessment criterion of 33 mg/kg.

Since level of PCB detected in the paint sample RPF-PS1 did not exceed the CCME-CEQG for PCB in soil at a commercial site (33 mg/kg), this paint, if removed from the Site, may be disposed of at an approved landfill facility. Therefore, leachability testing for PCB was not carried out on the paint sample.

2.5.1.4 Lead Leachate in Paint

Since the concentration of lead (18,400 mg/kg) in paint sample RPF-PS1 (blue on green on red paint – 3 layers) exceeded the applicable former Federal HPA criterion of 5,000 mg/kg, this paint sample was also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead leachate to determine whether or not the paint would be considered hazardous waste upon removal from the Site. The laboratory result for lead leachate in paint is presented in Table 2-4, Appendix G-2. The analytical result was compared to the provincial guideline for leachable toxic waste[1] and the federal regulation for the TDG criterion of 5 mg/L.

Results revealed that the concentration of lead leachate in paint sample RPF-PS1 (0.641 mg/L) did not exceed the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is not at a level considered hazardous, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

2.5.2 Soil Sample Results

2.5.2.1 Petroleum Hydrocarbons in Soil

A total of four soil samples (RPF-TP1-SS2, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP8-SS3), plus one blind field duplicate sample (DUP 1), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 2-5, Appendix G-2. Analytical results were compared to the CCME-CEQGs for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

BTEX and TPH were not detected in any of the soil samples analyzed and therefore are below the applicable assessment criteria.

2.5.2.2 Metals in Soil

A total of eight soil samples (RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1 and RPF-TP8-SS3), plus one blind field duplicate sample (DUP 2), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in

[1] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

Tables 2-6 and 2-7, Appendix G-2. Analytical results were compared to the CCME-CEQGs for industrial sites.

Concentrations of arsenic detected in soil samples RPF-TP3-SS1 (117 mg/kg), RPF-TP4-SS1 (185 mg/kg) and RPF-TP8-SS3 (12.8 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of chromium detected in soil samples RPF-TP5-SS3 (237 mg/kg), RPF-TP6-SS1 (129 mg/kg), RPF-TP7-SS1 (126 mg/kg) and DUP 2 (135 mg/kg) exceeded the applicable CCME-CEQG of 87 mg/kg.

Concentrations of copper detected in soil samples RPF-TP1-SS2 (136 mg/kg), RPF-TP2-SS4 (153 mg/kg), RPF-TP3-SS1 1,210 mg/kg), RPF-TP4-SS1 (1670 mg/kg), RPF-TP5-SS3 (563 mg/kg), RPF-TP7-SS1 (138 mg/kg) and DUP 2 (135 mg/kg) exceeded the applicable CCME-CEQG of 91 mg/kg.

The concentration of nickel detected in soil sample RPF-TP5-SS3 (76 mg/kg) exceeded the applicable CCME-CEQG of 50 mg/kg.

Concentrations of selenium detected in soil samples RPF-TP3-SS1 (23.8 mg/kg) and RPF-TP4-SS1 (28.8 mg/kg) exceeded the applicable CCME-CEQG of 3.9 mg/kg.

2.5.2.3 PAHs in Soil

One soil sample (RPF-TP6-SS1) collected at the Site was analyzed for PAHs. The analytical results are presented in Table 2-8, Appendix G-2. Analytical results were compared to the CCME-CEQG for industrial sites.

PAHs were not detected in soil sample RPF-TP6-SS1 and therefore are below the applicable assessment criteria.

2.5.2.4 PCBs in Soil

A total of two soil samples (RPF-TP2-SS4 and RPF-TP6-SS1) collected at the Site were analyzed for PCBs. The analytical results are presented in Table 2-9, Appendix G-2. Analytical results were compared to the CCME-CEQG for industrial sites.

PCBs were not detected (<0.005 mg/kg) in any of the soil samples analyzed and therefore are below the applicable assessment criteria of 33 mg/kg.

2.5.2.5 Cyanide in Soil

A total of eight soil samples (RPF-TP1-SS2, RPF-TP2-SS4, RPF-TP3-SS1, RPF-TP4-SS1, RPF-TP5-SS3, RPF-TP6-SS1, RPF-TP7-SS1 and RPF-TP8-SS3) and one tailings sample (RPF-TP9-SS1) collected at the Site were analyzed for total cyanide. The analytical results are presented in Tables 2-10 and 2-11, Appendix G-2. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of total cyanide detected in soil samples RPF-TP3-SS1 (13.1 mg/kg), RPF-TP4-SS1 (12.3 mg/kg) and RPF-TP7-SS1 (12.2 mg/kg) exceeded the applicable CCME-CEQG of 8.0 mg/kg.

The concentration of total cyanide detected in tailings samples RPF-TP9-SS1 (66.8 mg/kg) also exceeded the applicable CCME-CEQG of 8.0 mg/kg.

2.5.2.6 pH in Soil

A total of two soil samples (RPF-TP5-SS3 and RPF-TP8-SS3) collected at the Site were analyzed for pH. The analytical results are presented in Table 2-12, Appendix G-2. The results are compared to the CCME-CEQG for industrial sites.

The values of pH detected in soil samples RPF-TP5-SS3 (4.8) and RPF-TP8-SS3 (4.9) were less than the applicable CCME-CEQG of 6.0 to 8.0. This indicates that soils at the Site are acidic.

2.5.3 Groundwater Sample Results

2.5.3.1 Petroleum Hydrocarbons in Groundwater

One groundwater sample (RPF-MW1) collected at the Site was analyzed for BTEX/TPH. The analytical results are presented in Table 2-13, Appendix G-2. The results are compared to the CCME-FAL guidelines (revised 2005) and the 2003 Atlantic PIRI Tier I RBSLs for groundwater at a commercial site with coarse-grained soil and non-potable groundwater.

The concentration of toluene (2.9 µg/L) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guideline of 2.0 µg/L, but did not exceed the applicable 2003 Atlantic PIRI Tier I RBSL of 20,000 µg/L.

Modified TPH was not detected (<150 µg/L) in groundwater sample RPF-MW1 and therefore below the applicable assessment criterion of 20,000 µg/L.

2.5.3.2 Metals in Groundwater

One groundwater sample (RPF-MW1) collected at the Site was analyzed for metals plus hydrides. The analytical results are presented in Table 2-14, Appendix G-2. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of aluminum (23.2 mg/L), cadmium (0.037416 mg/L), chromium (0.002 mg/L), copper (3.96 mg/L), iron (3.39 mg/L), nickel (0.466 mg/L), selenium (0.0011 mg/L) and zinc (2.45 mg/L) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guidelines.

2.5.3.3 Cyanide in Groundwater

One groundwater sample (RPF-MW1) collected at the Site was analyzed for total cyanide. The analytical results are presented in Table 2-15, Appendix G-2. The results are compared to the CCME-FAL guideline of 0.005 mg/L.
Cyanide was not detected (<0.001 mg/L) in groundwater sample RPF-MW1 and therefore below the applicable assessment criterion of 0.005 mg/L.

2.5.3.4 General Water Chemistry in Groundwater

One groundwater sample (RPF-MW1) collected at the Site was analyzed for general water chemistry. The analytical results are presented in Table 2-16, Appendix G-2. The results are compared to the CCME-FAL guidelines (revised 2005).

The concentration of fluoride (0.70 mg/L) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

The value of pH detected in groundwater sample RPF-MW1 (3.63) was less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater at the Site is acidic.

2.5.4 Sediment Sample Results

2.5.4.1 Metals in Sediment

One sediment sample (RPF-SED1) collected from the holding pond of the processing facility present at the Site was analyzed for metals plus hydrides. The analytical results are presented in Table 2-17, Appendix G-2. The results are compared to the CCME Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments.

Concentrations of metals in sediment sample RFP-SED1 that exceeded the applicable CCME guidelines for freshwater sediments are as follows:

- Arsenic (368 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (5.3 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Copper (2,410 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (183 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3mg/kg);
- Mercury (4.05 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg); and
- Zinc (732 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

2.5.4.2 Cyanide in Sediment

One sediment sample (RPF-SED1) collected from the holding pond of the processing facility present at the Site was analyzed for total cyanide. The analytical result is presented in Table 2-18, Appendix G-2.

Since there are no the CCME-ISQGs and CCME-PELs for total cyanide in freshwater sediments, this parameter was assessed based on presence / absence.

Cyanide was detected in sediment sample RPF-SED1 at a concentration of 31.4 mg/kg.

2.5.4.3 pH in Sediment

One sediment sample (RPF-SED1) collected from the holding pond of the processing facility present at the Site was analyzed for pH. The analytical result is presented in Table 2-18, Appendix G-2. Since there are no the CCME-ISQGs and CCME-PELs for pH in freshwater sediments, for comparison purposes, the result was assessed based on acidic (0 to 7) and basic (7 to 14) conditions.

The value of pH detected in sediment sample RPF-SED1 (5.3) was less than 7.0, which indicates that sediment within the holding pond present at the Site is acidic.

2.5.5 Surface Water Sample Results

2.5.5.1 Metals in Surface Water

One surface water sample (RPF-SW1) collected from the drainage ditch located north of the processing facility and one surface water sample (RPF-SW2) collected from the holding pond of the processing facility was analyzed for metals plus hydrides. The analytical results are presented in Table 2-19, Appendix G-2. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of aluminum (31.9 mg/L), arsenic (0.605 mg/L), cadmium (0.009 mg/L), chromium (0.043 mg/L), copper (1.45 mg/L), iron (385 mg/L), lead (0.039 mg/L), nickel (0.140 mg/L), selenium (0.003 mg/L), silver (0.0008 mg/L) and zinc (7.08 mg/L) detected in surface water sample RPF-SW1 exceeded the applicable CCME-FAL guidelines.

Concentrations of aluminum (2.91 mg/L), cadmium (0.006 mg/L), copper (0.220 mg/L), iron (2.39 mg/L), lead (0.019 mg/L), nickel (0.040 mg/L), silver (0.0002 mg/L) and zinc (3.59 mg/L) detected in surface water sample RPF-SW2 exceeded the applicable CCME-FAL guidelines.

2.5.5.2 Cyanide in Surface Water

One surface water sample (RPF-SW1) collected from the drainage ditch located north of the processing facility and one surface water sample (RPF-SW2) collected from the holding pond of the processing facility was analyzed for total cyanide. The analytical results are presented in Table 2-20, Appendix G-2. The results are compared to the CCME-FAL guideline of 0.005 mg/L.

Concentrations of cyanide detected in surface water samples RPF-SW1 (0.003 mg/L) and RPF-SW2 (0.005 mg/L) did not exceed the applicable assessment criterion of 0.005 mg/L.

2.5.5.3 General Water Chemistry in Surface Water

One surface water sample (RPF-SW1) collected from the drainage ditch located north of the processing facility and one surface water sample (RPF-SW2) collected from the holding pond of the processing facility was analyzed for general water chemistry. The analytical results are presented in Table 2-21, Appendix G-2. The results are compared to the CCME-FAL guidelines (revised 2005).

The value of pH detected in surface water samples RPF-SW1 (2.66) and RPF-SW2 (3.16) were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that surface waters within the drainage ditch and holding pond are acidic.

2.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) identified at the Site are provided.

2.6.1 Lead in Paint

Results of the paint sampling program revealed that the concentration of lead (18,400 mg/kg) detected in the blue painted surfaces (i.e. blue on green on red paint) of the processing equipment remaining at the Site exceeded both the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg and therefore considered to a health hazard during any renovation/demolition activities at the Site.

The concentration of lead leachate (0.641 mg/L) detected in the blue paint did not exceed the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is not at a level considered hazardous, this paint, if removed from the Site, may be disposed be of at an approved landfill facility.

2.6.2 Petroleum Hydrocarbons

The concentration of toluene (2.9 µg/L) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guideline of 2.0 µg/L, but did not exceed the applicable 2003 Atlantic PIRI Tier I RBSL of 20,000 µg/L.

2.6.3 Cyanide

<u>Soil</u>
Concentrations of total cyanide detected in soil samples RPF-TP3-SS1 (13.1 mg/kg), RPF-TP4-SS1 (12.3 mg/kg) and RPF-TP7-SS1 (12.2 mg/kg) exceeded the applicable CCME-CEQG of 8.0 mg/kg. Soil samples RPF-TP3-SS1 and RPF-TP4-SS1 were collected adjacent to the holding pond (i.e. vats) and soil sample RPF-TP7-SS1 was collected at the location of the former cyanide drum storage area.

Raymo Tailings

The concentration of total cyanide detected in soil sample RPF-TP9-SS1 (66.8 mg/kg), collected from the Raymo tailings pile, exceeded the applicable CCME-CEQG of 8.0 mg/kg.

Sediment of Holding Pond

The concentration of total cyanide detected in sediment sample RPF-SED1 (31.4 mg/kg), collected from the holding pond (i.e. vats) of the processing facility, exceeded the CCME-CEQG of 8.0 mg/kg for cyanide in soil at a industrial site. Therefore, in the event that the processing facility is to be decommissioned, special consideration must be given to treatment/disposal of the sediments within the holding pond.

2.6.4 pH and General Chemistry

Soil

Values of pH detected in soil samples RPF-TP5-SS3 (4.8) and RPF-TP8-SS3 (4.9) were less than the applicable CCME-CEQG of 6.0 to 8.0. This indicates that soils at the Site are acidic. Soil samples RPF-TP5-SS3 and RPF-TP8-SS3 were collected within the area of buried waste/debris present at the Site.

Sediment

The value of pH detected in sediment sample RPF-SED1 (5.3), collected from the holding pond (i.e. vats) of the processing facility, was less than 7.0, indicating acidic conditions.

Groundwater

The value of pH detected in groundwater sample RPF-MW1 (3.63) was less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater at the Site is acidic. As well, the concentration of fluoride (0.70 mg/L) detected in this groundwater sample exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

Surface Water

The value of pH detected in surface water samples RPF-SW1 (2.66) and RPF-SW2 (3.16) were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Surface water sample RPF-SW1 was collected from the drainage ditch located north of the processing facility and surface water sample RPF-SW2 was collected from the holding pond (i.e. vats) of the processing facility. This indicates that surface waters within the drainage ditch and holding pond are acidic.

2.6.5 Metals

Soil

Concentrations of a combination of metals (i.e. arsenic, chromium, copper, nickel and selenium) detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

Sediment

Concentrations of metals (i.e. arsenic, cadmium, copper, lead, mercury and zinc) detected in sediment sample RPF-SED1 (31.4 mg/kg), collected from the holding pond (i.e. vats) of the processing facility, exceeded the CCME-ISQGs and PELs for freshwater sediment.

Groundwater

Concentrations of a combination of metals (i.e. aluminum, cadmium, chromium, copper, iron, nickel, selenium, silver and zinc) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guidelines. Based on this data and other testing conducted on the other media at the Site, it is likely that metal impacts in groundwater are widespread throughout the Site.

Surface Water

Concentrations of metals detected in surface water samples RPF-SW1 (i.e. aluminum, arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, and zinc) and RPF-SW2 (aluminum, cadmium, copper, iron, lead, nickel, silver and zinc) exceeded the applicable CCME-FAL guidelines. Surface water sample RPF-SW1 was collected from the drainage ditch located north of the processing facility and surface water sample RPF-SW2 was collected from the holding pond (i.e. vats) of the processing facility.

APPENDIX A-2

FIGURES

N
NORTH

TAILINGS

RAYMO
TAILINGS

DRAINAGE DITCH

EMBANKMENT

EMBANKMENT

CULVERT

FORMER ENCLOSED CHEMICAL / EQUIP.
STORAGE AREA (UNDER CONVEYOR)

DEBRIS

SUMP

CONVEYOR BELT

CONCRETE WALL

METAL DEBRIS

EQUIPMENT

TOWER

TOWER

EQUIPMENT

CONTROL ROOM AREA

GRAVEL ACCESS ROAD

FORMER SHED

FORMER OFFICE

TOWER

METAL DEBRIS

EMBANKMENT

EQUIP.

HOLDING POND
(WATER)

DEBRIS

CONCRETE PAD

METAL EQUIPMENT

EXPOSED PLASTIC LINER

GRAVEL

TO CYANIDE STORAGE AREA

SEE DETAIL 'A'

DUMPING / DEBRIS AREA

EMBANKMENT

FORMER CYANIDE DRUM
STORAGE AREA

OLD EQUIPMENT (METAL)

HEAVILY WOODED AREA

FORMER EQUIPMENT STORAGE AREA

METAL / WOOD DEBRIS

OLD EQUIPMENT

DETAIL 'A'

NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

TREE LINE

GRAVEL ACCESS ROADS

STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

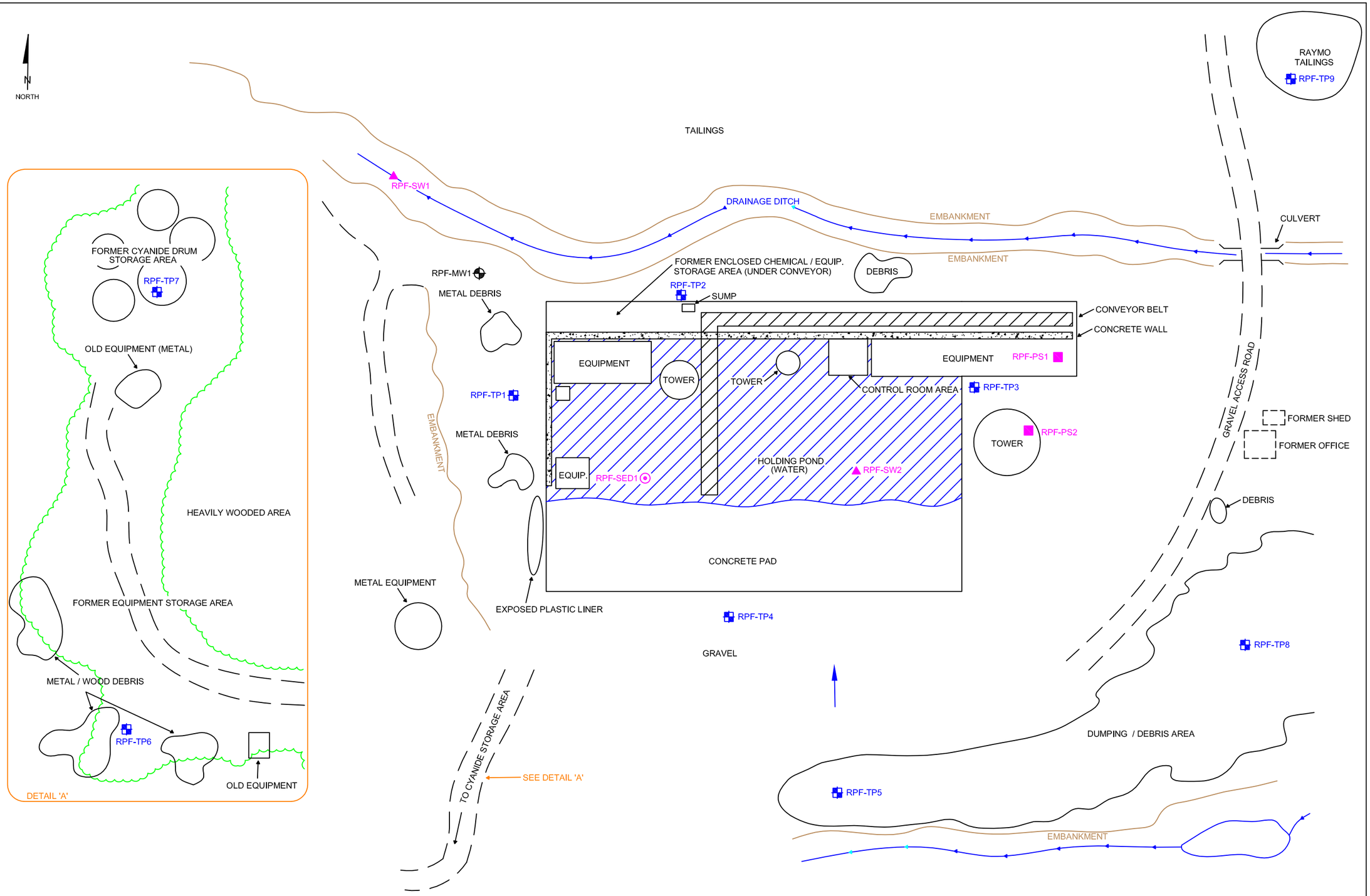
DRAWING TITLE

RAYMO PROCESSING FACILITY

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
2.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- PAINT SAMPLE LOCATION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAYMO PROCESSING FACILITY
SAMPLING LOCATIONS

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
2.2	January 2007	

APPENDIX B-2

PHOTOGRAPHIC RECORD

Photo 1: Overview of the Raymo Processing Facility.

Photo 2: Raymo Tailings – Northeast of the Facility.
(Potential for Cyanide Impacts)

Photo 3: Buried Waste – Southeast Corner of Site.

Photo 4: Metal Processing Equipment.
(Note: Not a Fuel Storage AST)

Photo 5: Equipment Storage Area – South of Site.

Photo 6: Former Cyanide Drum Storage Area - South of Site.

Photo 7: Possible Sump – North Side of the Facility.

Photo 8: Drainage Ditch – North of the Facility.

APPENDIX C-2

MONITOR WELL AND TEST PIT LOGS

LOG OF MONITORING WELL RPF-MW1

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 6, 2006** DATE COMPLETED: **September 6, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
	0		FILL - Grey, sand and gravel with some fines, cobbles and boulders, moist to saturated, loose to compact. No hydrocarbon odour.	STICK-UP: 1.10 (m)AGS DATE INSTALLED: September 6, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	63	27		UTM NAD27 East Coordinate: 565383 North Coordinate: 5526912
	1				2	SS	33	13		
					3	SS	0	6		
	2				4	SS	66	30		
			FILL - Grey and reddish brown with yellow seams, sand and gravel with some fines, organics, wood debris, cobbles and boulders, saturated, compact. No hydrocarbon odour.	WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 3.96						
▽	3									

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

Department of Natural Resources
Phase II Environmental Site Assessment
Raymo Processing Facility

Test Pit Identification Number	Depth From – To (m)	Soil Description
RPF-TP1	0.0 – 2.0 2.0	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RPF-TP2	0.0 – 3.5 3.5	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact. Test pit terminated in FILL. Note: 1) Groundwater encountered at 3.2 m depth. 2) No hydrocarbon odour present during excavation.
RPF-TP3	0.0 – 1.1 1.1 – 2.1 2.1	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. BOULDERS and COBBLES – Grey, some SAND and GRAVEL, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RPF-TP4	0.0 – 0.1 0.1 – 0.6 0.6	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. FILL – Grey, SANDY GRAVEL with some fines, cobbles and boulders, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Department of Natural Resources
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Test Pit Identification Number	Depth From – To (m)	Soil Description
RPF-TP5	0.0 – 0.6	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.6 – 0.75	FILL – Black, PEAT, saturated, loose.
	0.75 – 1.1	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, saturated, loose.
	1.1 – 2.0	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact.
	2.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.
RPF-TP6	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 0.9	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RPF-TP7	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 0.8	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	0.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

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Test Pit Identification Number	Depth From – To (m)	Soil Description
RPF-TP8	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 0.9	FILL – Black, PEAT, saturated, loose, wood debris.
	0.9 – 2.1	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact.
	2.1	Test pit terminated on possible Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RPF-TP9	0.0 – 0.9	FILL – Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.9	Test pit terminated in SAND and GRAVEL.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

APPENDIX D-2

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – RAYMO PROCESSING FACILITY

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)	COMMENTS (PETROLEUM HYDROCARBON ODOUR)
RPF-TP1	RPF-TP1-SS1	0.0 – 1.0	11.9	no odour
	RPF-TP1-SS2	1.0 – 2.0	14.7	no odour
RPF-TP2	RFP-TP2-SS1	0.0 – 1.0	13.1	no odour
	RFP-TP2-SS2	1.0 – 2.0	16.2	no odour
	RFP-TP2-SS3	2.0 – 3.1	17.3	no odour
	RFP-TP2-SS4	3.1 – 3.5	18.2	no odour
RPF-TP3	RPF-TP3-SS1	0.0 – 1.0	17.8	no odour
	RPF-TP3-SS2	1.0 – 2.0	15.4	no odour
RPF-TP4	RPF-TP4-SS1	0.0 - 0.55	15.6	no odour
RPF-TP5	RPF-TP5-SS1	0.0 – 0.6	16.1	no odour
	RPF-TP5-SS2	0.75 – 1.1	16.6	no odour
	RPF-TP5-SS3	1.1 – 2.0	17.4	no odour
RPF-TP6	RPF-TP6-SS1	0.0 – 0.9	15.6	no odour
RPF-TP7	RPF-TP7-SS1	0.0 – 0.8	18.2	no odour
RPF-TP8	RPF-TP8-SS1	0.0 – 0.25	58.6	no odour
	RPF-TP8-SS2	0.25 – 0.9	60.6	no odour
	RPF-TP8-SS3	1.0 – 2.0	62.9	no odour
RPF-TP9	RPF-TP9-SS1	0.0 – 0.9	8.8	no odour

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-2

FIELD PH, TEMPERATURE AND CONDUCTANCE DATA

Field Temperature, pH and Conductance in Groundwater Data - Raymo Processing Facility

MW Location	RPF-MW1		
Date	13-Sep-06		
Cumulative Volume Purged (L)	5.0	10.0	15.0
Field pH	4.40	4.47	4.52
Field Temp (Degrees C)	10.1	10.1	10.1
Field Conductance (uS/cm)	850	840	820

APPENDIX F-2

GPS COORDINATES

GPS COORDINATES - NAD27 - Raymo Processing Facility

Location	Northing	Easting
RPF-TP-1	565381	5526896
RPF-TP-2	565400	5526896
RPF-TP-3	565422	5526866
RPF-TP-4	565384	5526843
RPF-TP-5	565377	5526829
RPF-TP-6	565331	5526795
RPF-TP-7	565302	5526789
RPF-TP-8	565413	5526825
RPF-TP-9	565550	5526982
RFP-MW1	565383	5526912
RPF-SED1	565390	5526858
RPF-SW1	565402	5526911
RPF-SW2	565414	5526860
RPF-PS1	565432	5526865
RPF-PS2	565425	5526858

APPENDIX G-2

LABORATORY ANALYSES TABLES

Table 2-1. Lead in Paint - Raymo Processing Facility

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-10987	RPF-PS1	Drum/Equipment	Metal	Blue on Green on Red Paint	5	18400
S2006-10988	RPF-PS2	Tower	Metal	Blue on Red	5	92.2

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 2-2. Mercury in Paint - Raymo Processing Facility

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-10987	RPF-PS1	Drum/Equipment	Metal	Blue on Green on Red Paint	0.01	0.096
S2006-10988	RPF-PS2	Tower	Metal	Blue on Red	0.01	0.011

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 2-3. PCB in Paint - Raymo Processing Facility

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	PCB (mg/kg)
S2005-10411	RPF-PS1	Drum/Equipment	Metal	Blue on Green on Red Paint	0.005	16.6

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that PCB concentration is above the CCME-CEQG for a commercial property (33 mg/kg)

Table 2-4. Lead Leachate in Paint - Raymo Processing Facility

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Lead (mg/L)
S2006-10987	RPF-PS1	Drum/Equipment	Metal	Blue on Green on Red Paint	0.002	0.641

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 5.0 mg/L

Table 2-5: BTEX/TPH in Soil - Raymo Processing Facility

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			3.1 - 3.5	1.1 - 2.0	0 - 0.9	0 - 0.9	1.0 - 2.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-10581	S2006-10585	S2006-10586	S2006-10593	S2006-10588	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	RPF-TP1-SS2	RPF-TP5-SS3	RPF-TP6-SS1	DUP 1	RPF-TP8-SS3	INDUSTRIAL SITES			
DATE (D/M/Y)			06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10 (<10)	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50 (<50)	<50	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	<70	<70	<70	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	-	-	-	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 2-6: Metals in Soil - Raymo Processing Facility

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 -2.0 S2006-10581 RPF-TP1-SS2 06-Sep-06	3.1 - 3.5 S2006-10582 RPF-TP2-SS4 06-Sep-06	0 - 1.0 S2006-10583 RPF-TP3-SS1 06-Sep-06	0 - 0.5 S2006-10584 RPF-TP4-SS1 06-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	17100	17300	20600	14000	-
Antimony	0.5	<0.5	1.0	1.0	2.1	5.7	**40**
Arsenic	0.5	<0.5	1.4	3.9	**117**	**185**	**12**
Barium	0.5	<0.5	35.3	27.4	20.2	15.5	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	0.3	0.4	2.4	2.8	-
Cadmium	0.5	<0.5	<0.5	<0.5	1.4	2.3	**22**
Calcium	25	<25	2180	1930	8470	1990	-
Chromium	1	<1	36	48	64	47	**87**
Cobalt	1	<1	30	21	38	50	**300**
Copper	1	<1	**136**	**153**	**1210**	**1670**	**91**
Iron	5	<5	35500	39300	103000	130000	-
Lead	5	<5	<5	10	204	215	**600**
Magnesium	10	<10	13100	14400	16300	11600	-
Manganese	1	<1	1020	668	495	218	-
Mercury	0.01	<0.01	0.03	0.05	2.15	1.88	**50**
Molybdenum	2	<2	<2	2	10	11	**40**
Nickel	5	<5	27	23	22	17	**50**
Phosphorus	5	<5	714	709	486	501	-
Potassium	10	<10	1400	1120	1570	916	-
Selenium	0.1	<0.1	0.1	0.4	**23.8**	**28.8**	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	1.28	1.00	**40**
Sodium	25	<25	155	79	244	145	-
Vanadium	5	<5	57	64	78	74	**130**
Zinc	2	<2	55	49	183	300	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-7: Metals in Soil - Raymo Processing Facility

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		1.1 - 2.0	0 - 0.9	0 - 0.9	0 - 0.8	1.0 - 2.0	1999 CCME RECOMMENDED
LAB ID		S2006-10585	S2006-10586	S2006-10594	S2006-10587	S2006-10588	SOIL QUALITY GUIDELINES
FIELD ID		RPF-TP5-SS3	RPF-TP6-SS1	DUP 2	RPF-TP7-SS1	RPF-TP8-SS3	INDUSTRIAL (Revised 2005)
DATE (D/M/Y)		06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	26300	20000	21500	18200	20800	**-**
Antimony	0.5	3.0	1.3	1.1	1.6	1.5	**40**
Arsenic	0.5	10.6	1.5	2.2	0.7	**12.8**	**12**
Barium	0.5	31.9	4.9	6.3	9.4	8.6	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	0.9	<0.2	<0.2	<0.2	0.5	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	1340	699	949	1180	798	**-**
Chromium	1	**237**	**129**	**135**	**126**	82	**87**
Cobalt	1	39	18	21	18	9	**300**
Copper	1	**563**	88	**135**	**138**	72	**91**
Iron	5	66300	29400	33200	29600	37100	**-**
Lead	5	11	<5	6	<5	17	**600**
Magnesium	10	24700	14400	16200	14100	20400	**-**
Manganese	1	630	374	461	266	263	**-**
Mercury	0.01	0.06	0.06	0.12	0.05	0.13	**50**
Molybdenum	2	8	<2	<2	<2	<2	**40**
Nickel	5	**76**	36	40	41	22	**50**
Phosphorus	5	378	213	261	397	203	**-**
Potassium	10	881	160	238	460	146	**-**
Selenium	0.1	3.7	0.2	0.2	0.2	0.8	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	76	99	146	87	46	**-**
Vanadium	5	81	58	66	57	73	**130**
Zinc	2	100	36	41	37	47	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 2 is a blind field duplicate of soil sample RPF-TP6-SS1

Table 2-8: PAHs in Soil - Raymo Processing Facility

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	0 - 0.9 S2006-10586 RPF-TP6-SS1 06-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	-
Fluoranthene	0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-9: PCBs in Soil - Raymo Processing Facility

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m)			3.1 - 3.5	0 - 0.9	
LAB ID			S2006-10582	S2006-10586	
FIELD ID		Lab Blank	RPF-TP2-SS4	RPF-TP6-SS1	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
DATE (D/M/Y)			06-Sep-06	06-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-10: Cyanide in Soil - Raymo Processing Facility

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)			1.0 -2.0	3.1 - 3.5	0 - 1.0	0 - 0.5	
LAB ID			S2006-10581	S2006-10582	S2006-10583	S2006-10584	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	RPF-TP1-SS2	RPF-TP2-SS4	RPF-TP3-SS1	RPF-TP4-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	<0.001	0.225	7.88	**13.1**	**12.3**	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-11: Cyanide in Soil - Raymo Processing Facility

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		1.1 - 2.0	0 - 0.9	0 - 0.8	1.0 - 2.0	0 - 0.3	
LAB ID		S2006-10585	S2006-10586	S2006-10587	S2006-10588	S2006-10589	1999 CCME RECOMMENDED
FIELD ID		RPF-TP5-SS3	RPF-TP6-SS1	RPF-TP7-SS1	RPF-TP8-SS3	RPF-TP9-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	0.560	0.348	**12.2**	0.22	**66.8**	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-12: pH in Soil - Raymo Processing Facility

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m)			1.1 - 2.0	1.0 - 2.0	
LAB ID			S2006-10585	S2006-10588	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	RPF-TP5-SS3	RPF-TP8-SS3	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			06-Sep-06	06-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL	-	-	-	-
pH	-	5.7	**4.8**	**4.9**	**6.0 - 8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-13: BTEX/TPH in Groundwater - Raymo Processing Facility

		DATA		GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10867 RPF-MW1 14-Sep-06	CCME CEQGs (REVISED 2005) FAL	2003 ATLANTIC PIRI TIER I RBSL*
PARAMETERS	MDL (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	<0.2	<0.4	**370**	**6900**
Toluene	0.2	<0.2	**2.9**	**2**	**20000**
Ethylbenzene	0.3	<0.3	0.6	**90**	**20000**
Total Xylene	0.7	<0.7	3.7	**-**	**20000**
TPH (C6-C10)	50	<50	<50	**-**	**-**
TPH (>C10-C21)	50	<50	<50	**-**	**-**
TPH (>C21-<C32)	50	<50	<50	-	**-**
Modified TPH (C6-C32)	150	<150	<150	**-**	**20000**
Hydrocarbon Identification		-	-		

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold faced guidelines reflect those most applicable to current land use designation
Bold and underlined data exceeds the CCME-FAL
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
-: VALUE NOT ESTABLISHED
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable

Table 2-14: Metals Plus Hydrides in Groundwater - Raymo Processing Facility

		DATA		GUIDELINES
LAB ID REPORT ID DATE		Lab Blank	S2006-10867 RPF-MW1 13-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**23.2**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	**0.005**
Barium	0.001	<0.0005	0.020	**-**
Beryllium	0.001	<0.0001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.037416**	0.000017
Calcium	0.5	<0.5	176	**-**
Chromium	0.001	<0.001	**0.002**	**0.001**
Cobalt	0.001	<0.001	0.951	**-**
Copper	0.001	<0.001	**3.96**	**0.002-0.004**
Iron	0.01	<0.001	**3.39**	**0.3**
Lead	0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	<0.02	57.4	**-**
Manganese	0.001	<0.001	19.3	**-**
Mercury	0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	**0.466**	**0.025-0.15**
Phosphorus	0.02	<0.002	0.03	**-**
Potassium	0.02	<0.02	9.35	**-**
Selenium	0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	**0.0011**	**0.0001**
Sodium	0.5	<0.5	10.8	**-**
Vanadium	0.005	<0.002	0.005	**-**
Zinc	0.005	<0.001	**2.45**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 2-15: Cyanide in Groundwater - Raymo Processing Facility

		DATA		GUIDELINES
Lab ID			S2006-10867	CCME-CEQGs
FIELD ID		Lab Blank	RPF-MW1	(REVISED 2005)
DATE			13-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 2-16: General Water Chemistry in Groundwater - Raymo Processing Facility

		DATA		GUIDELINES
LAB ID			S2006-10867	CCME-CEQGs
FIELD ID		Lab Blank	RPF - MW1	(REVISED 2005)
DATE (D/M/Y)			13-Sep-06	FAL
PARAMETERS	Units			
Ammonia	(mg/L)	<0.01	0.21	-
Chloride	(mg/L)	<0.1	4.8	-
Conductivity	(µS/cm)	<5	1110	-
Fluoride	(mg/L)	<0.1	**0.7**	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	676	-
Nitrate as N	(mg/L)	<0.05	0.36	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	**0.06**
pH		7.86	**3.63**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001	**0.004**
Sulphate	(mg/L)	<0.1	835	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	-
Total Dissolved Solids	(mg/L)	<10	1260	-
Total Suspended Solids	(mg/L)	<2	72100	-
Cation Balance	(meq)	-	14.5	-
Anion Balance	(meq)	-	17.6	-
Ion Balance	(%)	-	-9.71	-
Calcium	(mg/L)	<0.5	176	-
Magnesium	(mg/L)	<0.02	57.4	-
Potassium	(mg/L)	<0.02	9.35	-
Sodium	(mg/L)	<0.5	10.8	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 2-17. Metals Plus Hydrides in Freshwater Sediment - Raymo Processing Facility

		DATA		GUIDELINES	
LAB ID		Lab Blank	S2006-10590	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID			RPF-SED1		
DATE (D/M/Y)			06-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	25100	-	-
Antimony	0.5	<0.5	3.8	-	-
Arsenic	0.5	<0.5	**368**	**5.9**	**17**
Barium	0.5	<0.5	8.6	-	-
Beryllium	0.2	<0.2	0.3	-	-
Bismuth	0.2	<0.2	5.6	-	-
Cadmium	0.5	<0.5	**5.3**	**0.6**	**3.5**
Calcium	25	<25	2410	-	-
Chromium	1	<1	18	**37.3**	**90**
Cobalt	1	<1	72	-	-
Copper	1	<1	**2410**	**37.5**	**197**
Iron	5	<5	196000	-	-
Lead	5	<5	**183**	**35**	**91.3**
Magnesium	10	<10	19100	-	-
Manganese	1	<1	738	-	-
Mercury	0.01	<0.01	**4.05**	**0.17**	**0.486**
Molybdenum	2	<2	15	-	-
Nickel	5	<5	24	-	-
Phosphorus	5	<5	1680	-	-
Potassium	10	<10	494	-	-
Selenium	0.1	<0.1	30.6	-	-
Silver	0.25	<0.25	0.87	-	-
Sodium	25	<25	174	-	-
Vanadium	5	<5	77	-	-
Zinc	2	<2	**732**	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 2-18. Cyanide and pH in Freshwater Sediment - Raymo Processing Facility

		DATA		GUIDELINES	
LAB ID			S2006-10590	1999 CCME RECOMMENDED	
FIELD ID		Lab Blank	RPF-SED1	SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
DATE (D/M/Y)			06-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	5	<0.001	31.4	-	-
pH	-	5.7	5.3 (5.4)	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
(#) Data in brackets indicates replicate result

Table 2-19: Metals Plus Hydrides in Surface Water - Raymo Processing Facility

		DATA			GUIDELINES
LAB ID			S2006-10591	S2006-10592	CCME-CEQGs
REPORT ID		Lab Blank	RPF-SW1	RPF-SW2	(REVISED 2005)
DATE			06-Sep-06	06-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**31.9**	**2.91**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	**0.605**	0.004	**0.005**
Barium	0.001	<0.0005	0.009	0.014	**-**
Beryllium	0.001	<0.0001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.009**	**0.006**	**0.000017**
Calcium	0.5	<0.5	133	146	**-**
Chromium	0.001	<0.001	**0.043**	0.001	**0.001**
Cobalt	0.001	<0.001	0.254	0.101	**-**
Copper	0.001	<0.001	**1.45**	**0.220**	**0.002-0.004**
Iron	0.01	<0.001	**385**	**2.39**	**0.3**
Lead	0.002	<0.002	**0.039**	**0.019**	**0.001-0.007**
Magnesium	0.02	<0.02	92.1	14.7	**-**
Manganese	0.001	<0.001	15.5	6.56	**-**
Mercury	0.0001	<0.0001	0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	**0.140**	**0.040**	**0.025-0.15**
Phosphorus	0.02	<0.002	0.36	0.03	**-**
Potassium	0.02	<0.02	6.98	13.3	**-**
Selenium	0.001	<0.001	**0.003**	<0.001	**0.001**
Silver	0.0001	<0.0001	**0.0008**	**0.0002**	**0.0001**
Sodium	0.5	<0.5	9.8	18.5	**-**
Vanadium	0.005	<0.002	0.033	<0.005	**-**
Zinc	0.005	<0.001	**7.08**	**3.59**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 2-20: Cyanide in Surface Water - Raymo Processing Facility

		DATA			GUIDELINES
Lab ID			S2006-10591	S2006-10592	CCME-CEQGs
FIELD ID		Lab Blank	RPF-SW1	RPF-SW2	(REVISED 2005)
DATE			06-Sep-06	06-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	0.003	0.005	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 2-21: General Water Chemistry in Surface Water - Raymo Processing Facility

		DATA			GUIDELINES
LAB ID			S2006-10591	S2006-10592	CCME-CEQGs
FIELD ID		Lab Blank	RPF-SW1	RPF-SW2	(REVISED 2005)
DATE (D/M/Y)			06-Sep-06	06-Sep-06	FAL
PARAMETERS	Units				
Ammonia	(mg/L)	<0.01	0.57	0.09	-
Chloride	(mg/L)	<0.1	8.2	4.2	-
Conductivity	(µS/cm)	<5	2300	960	-
Fluoride	(mg/L)	<0.1	0.1	0.1	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	711	425	-
Nitrate as N	(mg/L)	<0.05	<0.05	0.06	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	**0.06**
pH		8.09	**2.66**	**3.16**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001 (<0.001)	<0.001 (<0.001)	**0.004**
Sulphate	(mg/L)	<0.1	1930	591	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	-
Total Dissolved Solids	(mg/L)	<10	2620	755	-
Total Suspended Solids	(mg/L)	<2	482	3 (4)	-
Cation Balance	(meq)	-	35.5	9.77	-
Anion Balance	(meq)	-	40.4	11.1	-
Ion Balance	(%)	-	-6.50	-6.26	-
Calcium	(mg/L)	<0.5	133	146	-
Magnesium	(mg/L)	<0.02	92.1	14.7	-
Potassium	(mg/L)	<0.02	6.98	13.3	-
Sodium	(mg/L)	<0.5	9.8	18.5	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
(#) Data in brackets indicates replicate result

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APPENDICES

3.0 AREA B – EAST MINE

3.1 SITE DESCRIPTION

The East Mine Site is located approximately 1.5 km east of the Rambler Main Mine and consists of an open mine shaft and two existing buildings (refer to Figure 3.1, Appendix A-3 and Photos 1 and 2, Appendix B-3). Debris (wood, metal, etc.) is present on the ground surface throughout the Site.

Building No.1 is considered to be a safety hazard as part of the roof structure has collapsed under the weight of crushed ore left on top of the building and the entire building leans to one side, undermining its structural stability. Located at one end of the building is a small open hole accessing what is assumed to be the mine shaft.

Building No. 2 is considered to be a safety hazard and contains old sample containers, rusty drums and several pieces of machinery historically used at the Site for hoisting activities. One area of the building was once historically used for PCB storage, however documentation suggests that all PCB containing materials previously storage at the Site have been removed. Two former aboveground storage tanks (AST) holding cradles and a high pressure air tank were observed at the rear of the building (west side).

Former Building No.3 exists as a remaining concrete slab foundation.

3.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

3.2.1 Phase I ESA –March 2005

A review of the Phase I ESA completed at the Site in March 2005 revealed the following potential environmental concerns at the East Mine site:

- Potential asbestos containing materials (ACMs), in the form of exterior siding, was noted on west side of Building No.2;
- Potential lead and mercury-based paint on the painted surfaces present at the Site;
- PCBs were historically stored within Building No.2. A previous sampling program implemented at the Site in 2003 indicated that an area of soil within Building No. 2 was impacted with PCBs (130 mg/kg). Also, several swab samples collected at the PCB Storage Area inside Building No.2 indicated PCB containing fluids on the floor and walls of the structure;
- An area of buried metal debris was observed behind (east) Building No.1;
- Creosote timber debris was observed adjacent to Building No.1;
- Several empty drums, with no labels, were observed being stored inside Building No.1 and Building No.2; and
- Potential acid generating waste rock was observed throughout the Site.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation, consisting of a series of test pits and the subsequent collection of paint, asbestos, soil, surface water and sediment samples was recommended to assess the presence/absence of environmental impacts at the Site.

3.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). The following information and observations were recorded by AMEC at the time of the initial site inspection:

- Two concrete aboveground storage tank (AST) holding cradles were observed along west side of Building No.2 (refer to Figure 3.1, Appendix A-3 and Photos 3 and 4, Appendix B-3);
- An area of buried waste/debris was observed east of Building No.1 (refer to Figure 3.1, Appendix A-3 and Photo 5, Appendix B-3);
- Remnants of a concrete slab foundation (i.e. Building No.3) were observed approximately 30 m south of Building No.1. Possible fill and vent pipes belonging to an underground storage tank (UST) were observed along the southeast corner of the foundation (refer to Figure 3.1, Appendix A-3 and Photos 6 and 7, Appendix B-3);
- An area of discoloured soil and scattered metal/wooden debris was observed at the bottom of a steep embankment located south of Building No.3 (refer to Figure 3.1, Appendix A-3 and Photo 8, Appendix B-3);
- Four empty drums, with no labels, were observed being stored inside Building No.1 (refer to Figure 3.1, Appendix A-3 and Photo 9, Appendix B-3);
- One empty drum, with no label, was observed being stored inside the Sample Storage Area of Building No.2 (refer to Figure 3.1, Appendix A-3 and Photo 10, Appendix B-3);
- Building No. 1 was observed to be in very poor condition with crushed ore storage remaining on the screening equipment located on the roof (east side) of the structure. Creosote treated timbers and metal debris was also observed along the footprint of the structure (refer to Figure 3.1, Appendix A-3 and Photo 11, Appendix B-3);
- A metal pan containing traces of a black oily substance was observed inside the PCB Storage Area of Building No.2. The black oil substance within this pan may have leaked from transformers previously stored at the Site and therefore may contain PCBs (refer to Figure 3.1, Appendix A-3 and Photo 12, Appendix B-3);
- The location of test pit TP-1 (PCB 130 mg/kg), excavated inside the PCB Storage Area of Building No.2 in 2003, was identified. The location was clearly marked with red florescent paint (refer to Figure 3.1, Appendix A-3 and Photo 13, Appendix B-3);
- The surface water drainage ditch identified on the drawings of the East Mine site presented in the Phase I ESA was dry at the time of the initial site inspection, thus eliminating the requirement to collect surface water and sediment samples at the Site; and

- Potentially acidic generating waste rock was observed east of Building No.1, within the area of buried metal debris identified at the Site (refer to Photo 5, Appendix B-3).

3.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

3.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one pipe insulation sample (EM-ASB1), one dry wall compound sample (EM-ASB2) and one exterior siding sample (EM-ASB3) from Building No.2 for asbestos analyses;
- Collecting seven paint chip samples (EM-PS1 to EM-PS7) from painted surfaces present at the Site for lead, lead leachate, mercury, PCB and PCB leachate analyses;
- Excavating two test pits (EM-TP2 and EM-TP3) at the locations of the concrete AST holding cradles identified behind (west) Building No. 2 and collecting soil samples for BTEX/TPH and lead analyses;
- Excavating four test pits (EM-TP1, EM-TP4, EM-TP5 and EM-TP7) around the perimeter of the PCB Storage Area of Building No.2 and collecting soil samples for PCB analyses;
- Excavating three test pits (EM-TP8, EM-TP9 and EM-TP13) around the perimeter of the Building No.1 and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses;
- Excavating one test pit (EM-TP16) at the location of former test pit TP-1 and collecting one soil sample for PCB analyses to confirm the presence/absence of PCB impacted soil underneath the concrete slab foundation of the former PCB Storage Area of Building No.2;
- Excavating three test pits (EM-TP10 to EM-TP12) within the area of buried metal debris identified behind (east) of Building No.1 and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses;
- Excavating one test pit (EM-TP6) within the former surface water drainage ditch identified approximately 12 m north of Building No.2 and collecting soil samples for BTEX/TPH, metal plus hydrides and PCB analyses;
- Excavating one test pit (EM-TP14) at the location of the possible fill and vent pipes identified along the southeast corner of the concrete foundation (Building No.3) present at the Site and collecting soil samples for BTEX/TPH analyses;

- Excavating one test pit (EM-TP15) within the area of discoloured soil and scatter metal/wooden debris observed at the bottom of a steep embankment south of Building No.3 and collecting soil samples for BTEX/TPH, metal plus hydrides PCB analyses;
- Collecting three concrete samples (EM-CONC 1 to EM-CONC 3) from the concrete slab foundation of the PCB Storage Area within Building No.2 for PCB analyses;
- Collecting one waste rock sample (EM-WR1) at the Site for acid base accounting (ABA) analyses;
- Collecting one swab sample from an oil-stained metal pan located inside the former PCB Storage Area of Building No.2 for PCB analyses;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 3.2, Appendix A-3.

3.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

3.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness brown, reddish brown and grey sand and gravel with some cobbles and trace organics, boulders and fines. Wood debris was encountered in test pit EM-TP5 and wooden framing overlying an insulated water pipe, electrical conduit and a flex cable was observed in test pit EM-TP6. A possible open trench (void area) was observed in test pit EM-TP6 at a depth of 0.9 to 1.9 m below the ground surface (bgs). Thickness of the soil identified at the Site ranged from approximately 0.25 (EM-TP2) to 4.0 m bgs (EM-TP10). Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-3.

Please note that the metal pipes identified at the southeast corner of Building No.3 were determined to be potential air supply lines and not fill and vent pipes belonging to an UST (refer to Photo 14, Appendix B-3).

3.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of volatile organic vapours being released from the soils. SVH readings ranged from 0.0 parts per million (ppm) to 60.1 ppm (refer to Appendix D-3). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

3.4.2.3 Groundwater Conditions

Groundwater was only encountered in one (EM-TP10) of the 16 test pits excavated at the Site at a depth of 2.7 m bgs.

3.4.2.4 Contaminant Observations

Petroleum Hydrocarbons

No petroleum hydrocarbon odours or free phase petroleum hydrocarbon product was detected in any of the test pits excavated at the Site during the current investigation.

3.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-3.

3.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the East Mine site is outlined in Table 3-1 below.

Table 3-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	EM-PS1, EM-PS2, EM-PS3, EM-PS4, EM-PS5, EM-PS6, EM-PS7	Lead and Mercury
	EM-PS1	PCB and PCB Leachate (TCLP)
	EM-PS3, EM-PS4, EM-PS7	Lead Leachate (TCLP)
Asbestos	EM-ASB1, EM-ASB2, EM-ASB3	Asbestos
Concrete	EM-CONC 1, EM-CONC 2, EM-CONC 3	PCB
Swab	EM-SWAB	PCB
Soil	EM-TP2-SS1, EM-TP3-SS1, EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, EM-TP14-SS1, EM-TP15-SS1, DUP 8	BTEX/TPH
	EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, DUP 10	Metals Plus Hydrides
	EM-TP2-SS1, EM-TP3-SS1	Lead
	EM-TP8-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1	PAHs
	EM-TP1-SS1, EM-TP4-SS1, EM-TP5-SS1, EM-TP6-SS1, EM-TP7-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, EM-TP15-SS1, EM-TP16-SS1, DUP 9	PCBs
Waste Rock	EM-WR1	Acid Base Accounting

Notes:
DUP 8 is a blind field duplicate of soil sample EM-TP2-SS1 for BTEX/TPH analysis
DUP 9 is a blind field duplicate of soil sample EM-TP1-SS1 for PCB analysis
DUP 10 is a blind field duplicate of soil sample EM-TP13-SS1 for metals plus hydrides analysis

3.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for asbestos, paint, swab, soil, concrete and waste rock samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-3. Sample locations are presented on Figure 3.2, Appendix A-3 and the Laboratory Certificates of Analyses are presented in Section 13.0.

3.5.1 Asbestos Sample Results

There are over 3,000 asbestos containing materials (ACMs), which can be divided into two broad categories: friable and non-friable.

- **Friable ACMs** are defined as materials that can be crumbled, pulverized and reduced to powder when dry using hand pressure. Typical friable materials include acoustical or decorative spray applications, fireproofing and thermal insulation; and
- **Non-friable ACMs** are hard or manufactured products such as floor tiles, fire blankets, pre-formed manufactured cementitious insulation and wallboards, pipes, and siding, wherein the asbestos fibres are bound to the substrate.

A total of three building material samples (EM-ASB-1 to EM-ASB3 to ASB-10) collected from Building No.2 present at the Site were analyzed for asbestos (refer to Figure 3.2, Appendix A-3). The laboratory results for asbestos are presented in Table 3-1, Appendix F-2. The results are compared to the "The Asbestos Abatement Regulations", 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Analytical results revealed that concentrations of asbestos detected in samples EM-ASB2 (10% chrysotile) and EM-ASB-3 (25% chrysotile) exceeded the applicable assessment criterion of 1%. Sample EM-ASB2 consisted of drywall joint compound and sample EM-ASB3 consisted of exterior siding collected from Building No.2. Asbestos was not detected in sample EM-ASB-1, collected from the pipe insulation present within Building No.2. Asbestos fibres in drywall joint compound and exterior siding are considered to be "non-friable", unless disturbed.

3.5.2 Paint Sample Results

3.5.2.1 Lead in Paint

A total of seven paint samples (EM-PS1 to EM-PS7) collected from the painted surfaces present at the Site were submitted to the laboratory for lead analyses. The laboratory results for lead in paint are presented in Table 3-2, Appendix F-3. The results are compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentrations of lead detected in all paint samples, with the exception of paint sample EM-PS6, exceeded the Federal HPA criterion of 600 mg/kg and therefore considered to a health hazard during any renovation/demolition activities at the Site. Concentrations of lead detected in paint ranged from 558 mg/kg (EM-PS6) to 10,900 mg/kg (EM-PS7).

Concentrations of lead detected in the paint samples EM-PS3 (7,290 mg/kg), EM-PS4 (6,050 mg/kg) and EM-PS7 (10,900 mg/kg) also exceeded the former Federal HPA criterion of 5,000 mg/kg.

3.5.2.2 Mercury in Paint

A total of seven paint samples (EM-PS1 to EM-PS7) collected from the painted surfaces present at the Site were submitted to the laboratory for mercury analyses. The laboratory results for mercury in paint are presented in Table 3-3, Appendix F-3. The results are compared to the Federal HPA criterion of 10 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that the concentrations of mercury detected in all paint samples analyzed did not exceed the Federal HPA criterion of 10 mg/kg. Results ranged from 0.011 mg/kg (RFP-PS2) to 0.096 mg/kg (RPF-PS1).

Since levels of mercury detected in the paint samples did not exceed the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), leachability testing for mercury was not carried out on the paint samples.

3.5.2.3 PCB in Paint

One paint sample (EM-PS1) collected from the interior wall of Building No.2 (light green paint) was submitted to the laboratory for PCB analyses. The laboratory result for PCB in paint is presented in Table 3-4, Appendix F-3. The results are compared to the CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site.

Results of the paint sampling program revealed that the concentration of PCB (71.1 mg/kg) detected in paint sample EM-PS1 exceeded the applicable CCME-CEQG of 33 mg/kg.

3.5.2.4 Lead Leachate in Paint

Since concentrations of lead in paint samples EM-PS1 (green on grey paint), EM-PS4 (red on green on grey paint) and EM-PS7 (grey on green paint) exceeded the applicable former Federal HPA criterion of 5,000 mg/kg, these paint samples were also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead leachate to determine if the paints would be considered hazardous waste upon removal from the Site. The laboratory result for lead leachate in paint is presented in Table 3-5, Appendix F-3. The result is compared to the provincial guideline for leachable toxic waste[1] and the federal regulation for the TDG criterion of 5 mg/L.

Results revealed that the concentration of lead leachate in paint sample EM-PS7 (5.29 mg/L) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is at a level considered hazardous, in the absence of further rationalization (i.e. dilute with substrate), this paint, if removed from the Site, must be disposed of as hazardous waste.

3.5.2.5 PCB Leachate in Paint

Since concentration of PCB in paint sample EM-PS3 (light green paint) exceeded the applicable CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site, this paint sample was also analyzed using the TCLP for PCB leachate to determine if the paints would be considered hazardous waste upon removal from the Site. The laboratory result for PCB leachate in paint is presented in Table 3-6, Appendix F-3. The result is compared to the federal regulation for the TDG criterion of 0.3 mg/L.

Results revealed that the concentration of PCB leachate in paint sample EM-PS7 (0.007 mg/L) did not exceed the applicable assessment criterion of 0.3 mg/L. Therefore, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

3.5.3 Concrete Sample Results

3.5.3.1 PCBs in Concrete

A total of three concrete samples (EM-CONC 1 to EM-CONC 3) collected from the concrete floor of the PCB Storage Area of Building No.2 were analyzed for PCBs. The analytical results are presented in Table 3-7, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of PCBs in concrete samples EM-CONC 1 (12.9 mg/kg), EM-CONC 2 (27.1 mg/kg) and EM-CONC 3 (29.0 mg/kg) were detected at levels below the applicable assessment criterion of 33 mg/kg.

3.5.4 Swab Sample Results

3.5.4.1 PCBs in Swab Sample

One swab sample (EM-SWAB) collected from the surface of an oil-stained metal pan located inside the PCB Storage Area of Building No.2 was analyzed for PCBs. The analytical result is presented in Table 3-8, Appendix F-3. There are no available Provincial guidelines for the comparison of PCB swab results; therefore, for comparison purposes, the result was compared to the U.S. EPA guideline of 10 ug/100 cm^2 for PCB transformers destined for metal recycling, based on its 1987 PCB Spill Clean-up Policy (40 CFR 761.12).

The concentration of PCBs detected in swab sample EM-SWAB (40.9 µg/100 cm^2) exceeded the U.S. EPA guideline of 10 ug/100 cm^2. Therefore, the metal pan must be treated as a hazardous material and cannot be sent to a metal recycling facility, but to an approved hazardous materials treatment facility. Based on the testing completed, it is highly likely that a transformer(s) was historically stored on the metal pan present at the Site.

[1] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

3.5.5 Soil Sample Results

3.5.5.1 Petroleum Hydrocarbons in Soil

A total of 10 soil samples (EM-TP2-SS1, EM-TP3-SS1, EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP14-SS1, EM-TP15-SS1), plus one blind field duplicate sample (DUP 8), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 3-9 to 3-11, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of BTEX and TPH were either non-detect or detected at levels below the applicable assessment criteria in all soil samples analyzed.

3.5.5.2 Metals in Soil

A total of eight soil samples (EM-TP6-SS1, EM-TP8-SS1, EM-TP9-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1 and EM-TP15-SS1), plus one blind field duplicate sample (DUP 10), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 3-12 and 3-13, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of arsenic detected in soil samples EM-TP8-SS1 (23.6 mg/kg), EM-TP9-SS1 (24.7 mg/kg), EM-TP11-SS1 (186 mg/kg), EM-TP12-SS1 (39.0 mg/kg), EM-TP13-SS1 (17.6 mg/kg), EM-TP15 (20.9 mg/kg) and DUP 10 (17.8 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of chromium detected in soil samples EM-TP8-SS1 (98 mg/kg), EM-TP10-SS4 (113 mg/kg), EM-TP12-SS1 (203 mg/kg) and EM-TP15-SS1 (189 mg/kg) exceeded the applicable CCME-CEQG of 87 mg/kg.

Concentrations of copper detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 91 mg/kg. Concentrations of copper detected in soil ranged from 155 mg/kg (EM-TP6-SS1) to 19,500 mg/kg (EM-TP12-SS1).

Concentrations of selenium detected in soil samples EM-TP11-SS1 (13.2 mg/kg) and EM-TP15-SS1 (10.1 mg/kg) exceeded the applicable CCME-CEQG of 3.9 mg/kg.

3.5.5.3 Lead in Soil

A total of two soil samples (EM-TP2-SS1 and EM-TP3-SS1) collected adjacent to the former AST holding cradles located at west side of Building No.2 present at the Site were analyzed for lead. The analytical results are presented in Table 3-14, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of lead detected in both soil samples analyzed were detected at levels below the applicable assessment criteria of 600 mg/kg for industrial sites. Results ranged from 23.0 mg/kg (EM-TP2-SS1) to 39.0 mg/kg (EM-TP3-SS1).

3.5.5.4 PAHs in Soil

A total of four soil samples (EM-TP8-SS1, EM-TP10-SS4, EM-TP11-SS1 and EM-TP12-SS1) collected at the Site was analyzed for PAHs. The analytical results are presented in Table 3-15, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites.

PAHs were not detected in any of the soil samples analyzed and therefore are below the applicable assessment criteria.

3.5.5.5 PCBs in Soil

A total of 11 soil samples (EM-TP1-SS1, EM-TP4-SS2, EM-TP5-SS1, EM-TP6-SS1, EM-TP7-SS1, EM-TP10-SS4, EM-TP11-SS1, EM-TP12-SS1, EM-TP13-SS1, EM-TP15-SS1 and EM-TP16-SS1), plus one blind field duplicate sample (DUP 9), collected at the Site were analyzed for PCBs. The analytical results are presented in Tables 3-16 to 3-18, Appendix F-3. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of PCBs were either non-detect or detected at levels below the applicable assessment criterion of 33 mg/kg in all soil samples analyzed. Concentrations of PCBs detected in soil ranged from 0.015 mg/kg (EM-TP7-SS1) to 6.21 mg/kg (EM-TP16-SS1).

3.5.6 Waste Rock Sample Results

3.5.6.1 ABA Results

One waste rock sample (EM-WR1) collected at the Site was analyzed for ABA using the Sorbek Testing Method. The difference between the two values, Acid Potential (AP) and Neutralizing Potential (NP), is the rock's Net Neutralization Potential (Net NP). A negative Net NP indicates that the rock is acid producing. The analytical results are presented in Table 3-19, Appendix F-3.

The analytical results revealed a positive value for Net Neutralizing Potential (NP) indicating that the waste rock sampled is not a net acid producer, however, since the NP/AP ratio was less than 4.0 the waste rock should be considered potential acid generating (PAG), given a safety factor of 4.0 (Price, 1997).

3.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

3.6.1 Asbestos Containing Materials

Asbestos was detected in the drywall compound and exterior siding (west side) of Building No.2. Asbestos fibres in drywall joint compound and siding are considered to be "non-friable", unless disturbed.

3.6.2 Lead in Paint

Results of the paint sampling program revealed that the concentrations of lead detected in all paint samples, with the exception of paint samples EM-PS6 (red paint) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to a health hazard during any renovation/demolition activities at the Site.

The concentration of lead leachate (5.29 mg/L) in paint sample EM-PS7 (grey on green paint on the mechanical equipment inside Building No.2) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is at a level considered hazardous. In the absence of further consideration (i.e. dilute with substrate), this paint must be disposed of as a hazardous material.

3.6.3 PCBs

<u>Swab</u>
The concentration of PCBs detected in swab sample EM-SWAB (40.9 µg/100 cm^2) exceeded the U.S. EPA guideline of 10 ug/100 cm^2. Therefore, the metal pan must be treated as a hazardous material and cannot be sent to a metal recycling facility, but to an approved hazardous materials treatment facility. The detection of PCB in the swab sample confirms that PCB containing liquid (i.e. dielectric fluid) had been released onto the surfaces of the metal pan.

<u>Concrete</u>
Concentrations of PCBs in the three concrete samples EM-CONC 1 (12.9 mg/kg), EM-CONC 2 (27.1 mg/kg) and EM-CONC 3 (29.0 mg/kg) collected from the slab-on-grade floor of the PCB Storage Area of Building No. 2 were detected at levels below the applicable assessment criteria of 33 mg/kg for PCBs in soil at industrial sites. Based on the testing completed, the levels of PCBs detected in concrete floor of the former PCB Storage Area of Building No.2 are not considered to be a concern at this time.

<u>Soil</u>
Concentrations of PCBs in all 11 soil samples collected at the Site were either non-detect or detected at levels below the applicable assessment criterion of 33 mg/kg for PCBs in soil at industrial sites. Please note that the concentration of PCBs (6.21 mg/kg) detected in soil sample EM-TP16-SS1, collected at the location of soil sample TP-1 (JWEL 2003) that revealed a PCB concentration of 133 mg/kg, did not exceed the applicable assessment criteria of 33 mg/kg for PCBs in soil at industrial sites. Therefore,

based on the testing completed, PCB contaminated soil is not suspected to be a major issue at the Site at this time.

3.6.4 Metals

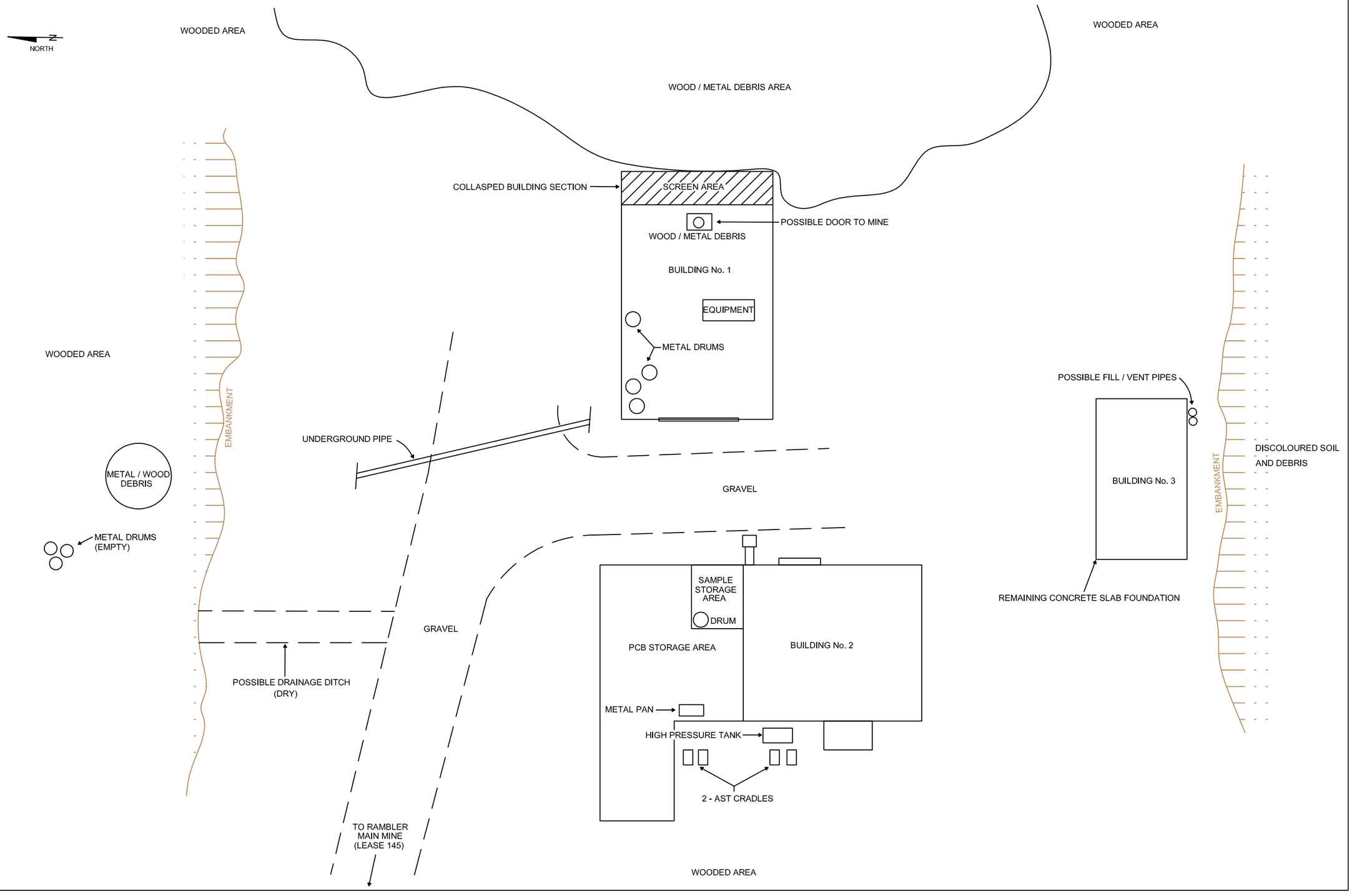
Concentrations of a combination of metals (i.e. arsenic, chromium, copper and selenium) detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

3.6.5 PAG Waste Rock

Based on the testing completed during the current investigation, it is evidence that PAG waste rock is present throughout the Site.

APPENDIX A-3

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS

CLIENT

DEPARTMENT OF NATURAL RESOURCES

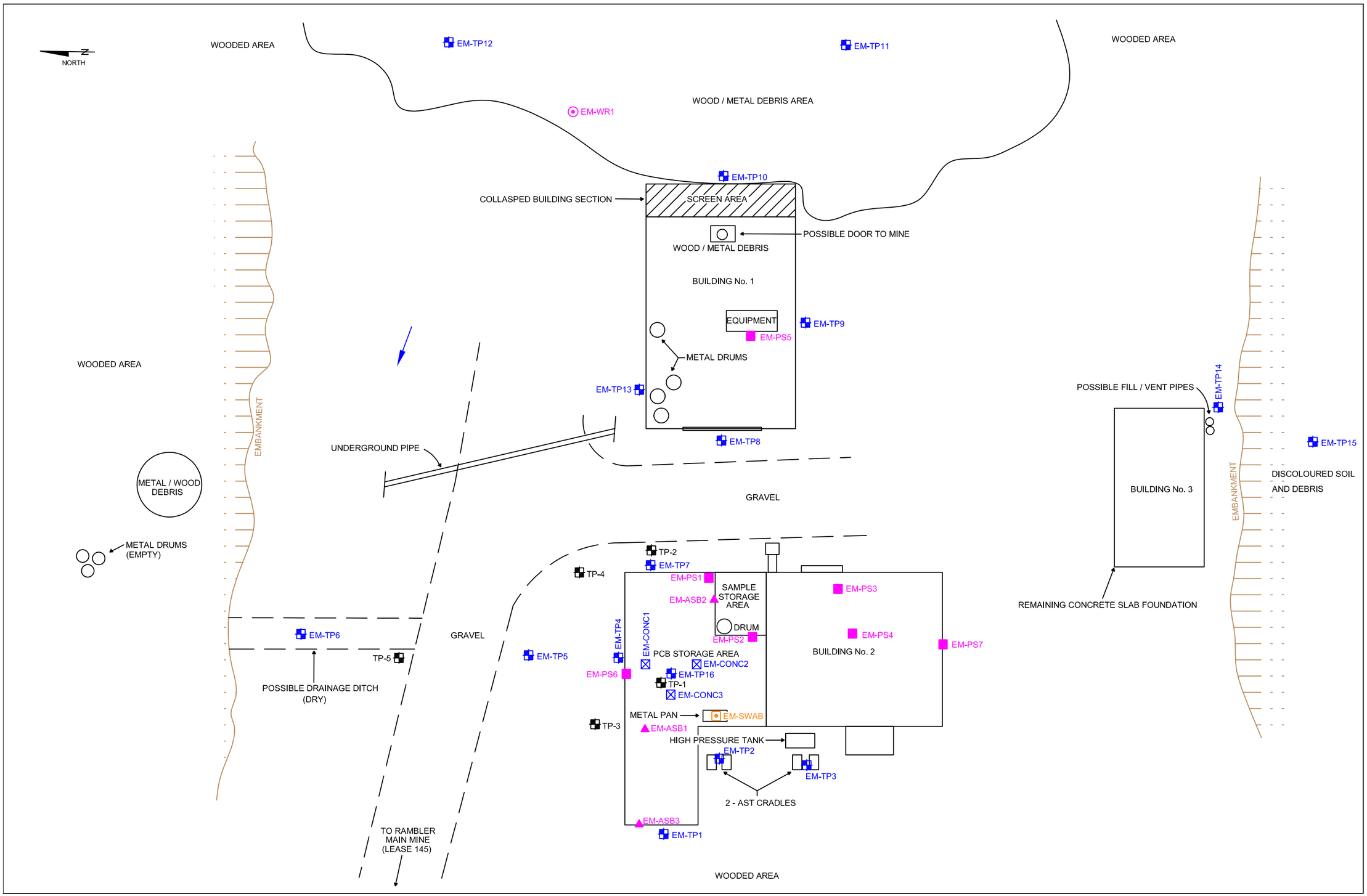
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

EAST MINE SITE

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
3.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- GRAVEL ACCESS ROADS
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- JWEL TEST PIT LOCATION
- WASTE ROCK SAMPLE
- ASBESTOS SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- CONCRETE SAMPLE LOCATION
- SWAB SAMPLE LOCATION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

EAST MINE SITE
SAMPLE LOCATIONS

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
3.2	January 2007	

APPENDIX B-3

PHOTOGRAPHIC RECORD

Photo 1: East Mine – Building No.1.

Photo 2: East Mine – Building No.2.

Photo 3: Former AST Cradle (1 of 2) behind Building No.2.

Photo 4: Former AST Cradle (2 of 2) behind Building No.2.

Photo 5: Buried Waste East of Building No.1.
(Also Note Potential Acid Generating Waste Rock)

Photo 6: Concrete Foundation of Building No.3.

Photo 7: Possible Fill and Vent Pipe at Building No. 3.
(Possible UST)

Photo 8: Embankment Located Behind Building No.3.
(Discolored Soil and Debris)

Photo 9: Typical Drum Storage inside Building No.1.
(No Label – Empty)

Photo 10: Drum - Sample Storage Area of Building No.2.
(No Label - Empty)

Photo 11: Condition of Building No. 1.
(Note Ore Storage and Creosote Timber Debris)

Photo 12: Oily Metal Pan - PCB Storage Area of Building No.2.

Photo 13: Building No. 2 - PCB Storage Area.
(Location of JWEL TP-1: PCB 130 mg/kg)

Photo 14: Potential Air and Wire Pipelines – Building No.3.
(Not UST Fill and Vent Pipes)

APPENDIX C-3

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
East Mine

Test Pit Identification Number	Depth From – To (m)	Soil Description
EM-TP1	0.0 – 0.4	FILL – Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.4	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP2	0.0 – 0.3	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP3	0.0 – 0.3	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP4	0.0 – 0.3	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.3 – 0.6	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.6 – 1.2	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.2	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP5	0.0 – 0.8	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
EM-TP6	0.0 – 0.4	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.4 – 2.1	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP7	0.0 -1.0	PEAT – Dark brown, PEAT with some sand and gravel, occasional cobbles, moist, loose.
	1.0 – 1.2	GLACIAL TILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.2	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP8	0.0 – 0.2	FILL – Light brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.2 – 0.7	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.7 – 0.9	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP9	0.0 – 0.1	FILL – Light brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.1 – 0.7	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
EM-TP10	0.0 – 2.0	FILL – Brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.0 – 2.6	FILL – Dark brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	2.6 – 4.0	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact.
	4.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.7 m depth. 2) No hydrocarbon odour present during excavation.
EM-TP11	0.0 – 0.8	FILL – Brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.8 – 1.1	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.1 – 1.5	FILL – Light brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP12	0.0 – 0.3	FILL – Grey, SAND and GRAVEL with some fines, cobbles, wood debris, moist, compact.
	0.3 – 0.8	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, compact.
	0.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
EM-TP13	0.0 – 0.6	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.6 – 0.9	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP14	0.0 – 0.5	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, metal debris, moist, compact.
	0.5 – 1.0	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
EM-TP15	0.0 – 0.4	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.4	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

APPENDIX D-3

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – EAST MINE SITE

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)	COMMENTS (PETROLEUM HYDROCARBON ODOUR)
EM-TP1	EM-TP1-SS1	0.0 – 0.3	0.0	no odour
EM-TP2	EM-TP2-SS1	0.0 – 0.25	8.9	no odour
EM-TP3	EM-TP3-SS1	0.0 – 0.3	5.3	no odour
EM-TP4	EM-TP4-SS1	0.0 – 0.6	9.2	no odour
	EM-TP4-SS2	0.6 – 1.2	11.5	no odour
EM-TP5	EM-TP5-SS1	0.0 – 0.8	10.8	no odour
EM-TP6	EM-TP6-SS1	0.0 – 0.9	15.3	no odour
	EM-TP6-SS2	1.1 – 2.1	10.5	no odour
EM-TP7	EM-TP7-SS1	0.0 – 1.0	18.3	no odour
EM-TP8	EM-TP8-SS1	0.0 – 0.9	25.7	no odour
EM-TP9	EM-TP9-SS1	0.0 – 0.2	16.2	no odour
EM-TP10	EM-TP10-SS1	0.0 – 1.0	4.0	no odour
	EM-TP10-SS2	1.0 – 2.0	50.8	no odour
	EM-TP10-SS3	2.0 – 3.0	59.9	no odour
	EM-TP10-SS4	3.0 – 4.0	60.1	no odour
EM-TP11	EM-TP11-SS1	0.0 – 0.8	55.8	no odour
	EM-TP11-SS2	0.8 – 1.5	39.5	no odour
EM-TP12	EM-TP12-SS1	0.0 – 0.75	56.2	no odour
EM-TP13	EM-TP13-SS1	0.0 – 0.9	42.7	no odour
EM-TP14	EM-TP14-SS1	0.5 – 1.0	48.3	no odour
EM-TP15	EM-TP15-SS1	0.0 – 0.3	33.5	no odour
EM-TP16	EM-TP16-SS1	0.0 – 0.3	39.4	no odour

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-3

GPS COORDINATES

GPS COORDINATES - NAD27 - EAST MINE

Location	Northing	Easting
EM-TP1	567390	5527765
EM-TP2	567419	5527778
EM-TP3	267407	5527763
EM-TP4	567403	5527777
EM-TP5	567404	5527787
EM-TP6	567395	5527803
EM-TP7	567414	5527783
EM-TP8	567434	5527774
EM-TP9	567449	5527774
EM-TP10	567482	5527788
EM-TP11	567503	5527814
EM-TP12	567473	5527819
EM-TP13	567430	5527784
EM-TP14	567450	5527752
EM-TP15	567451	5527733
EM-TP16	567409	5527775
EM-CONC 1	567408	5527775
EM-CONC 2	567410	5527775
EM-CONC 3	567409	5527774
EM-PS1	567405	5527773
EM-PS2	567411	5527800
EM-PS3	567412	5527767
EM-PS4	567409	5527762
EM-PS5	567437	5527762
EM-PS6	567401	5527703
EM-PS7	567439	5527752
SWAB	567407	5527760
EM-WR1	567484	5527816

APPENDIX F-3

LABORATORY ANALYSES TABLES

Table 3-1: Summary of Building Materials Samples and Asbestos Analysis - East Mine Site

Sample ID	Sample Location	Sample Type	Asbestos Fibre %		
			Chrysotile	Amosite	other asbestos fibres
EM-ASB1	Building No. 2	Pipe Insulation	nd	nd	nd
EM-ASB2	Building No. 2	Dry Wall Joint Compound	10	nd	nd
EM-ASB3	Building No. 2	Exterior Siding	25	nd	nd

Note: Shaded results are above maximum as outlined under “The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.
trace: <1%
nd: not detected

Table 3-2. Lead in Paint - East Mine Site

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-10990	EM-PS1	Building No.2 - Interior Wall	Wood	Light Green Paint	5	**751**
S2006-10991	EM-PS2	Building No.2 - Interior Wall	Wood	Grey Paint	5	**4890**
S2006-10992	EM-PS3	Building No.2 - Compressor	Metal	Green on Grey Paint	5	7290
S2006-10993	EM-PS4	Building No.2 - Hoist Equipment	Metal	Red on Green on Grey Paint	5	6050
S2006-10994	EM-PS5	Building No.1 - Possible Boiler	Metal	Grey Paint	5	**1130**
S2006-10995	EM-PS6	Building No.2 - Steel Beams	Metal	Red Paint	5	558
S2006-10996	EM-PS7	Building No.2 - Mechanical Equipment	Metal	Grey on Green Paint	5	10900 (9960)

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/k
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 3-3. Mercury in Paint - East Mine Site

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-10990	EM-PS1	Building No.2 - Interior Wall	Wood	Light Green Paint	0.01	0.284
S2006-10991	EM-PS2	Building No.2 - Interior Wall	Wood	Grey Paint	0.01	0.552
S2006-10992	EM-PS3	Building No.2 - Compressor	Metal	Green on Grey Paint	0.01	0.018
S2006-10993	EM-PS4	Building No.2 - Hoist Equipment	Metal	Red on Green on Grey Paint	0.01	0.018
S2006-10994	EM-PS5	Building No.1 - Possible Boiler	Metal	Grey Paint	0.01	0.024
S2006-10995	EM-PS6	Building No.2 - Steel Beams	Metal	Red Paint	0.01	0.018
S2006-10996	EM-PS7	Building No.2 - Mechanical Equipment	Metal	Grey on Green Paint	0.01	0.029 (0.021)

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 3-4. PCB in Paint - East Mine Site

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	PCB (mg/kg)
S2006-10990	EM-PS1	Building No.2 - Interior Wall	Wood	Light Green Paint	0.005	71.1

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that PCB concentration is above the CCME-CEQG for a commercial property (33 mg/kg)

Table 3-5. Lead Leachate in Paint - East Mine Site

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Lead (mg/L)
S2006-10992	EM-PS3	Building No.2 - Compressor	Metal	Green on Grey Paint	0.002	2.510
S2006-10993	EM-PS4	Building No.2 - Hoist Equipment	Metal	Red on Green on Grey Paint	0.002	0.488
S2006-10996	EM-PS7	Building No.2 - Mechanical Equipment	Metal	Grey on Green Paint	0.002	**5.290**

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 5.0 mg/L

Table 3-6. PCB Leachate in Paint - East Mine Site

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP PCB (mg/L)
S2006-10990	EM-PS1	Building No.2 - Interior Wall	Wood	Light Green Paint	0.002	0.007

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 0.3 mg/L

Table 3-7: PCBs in Concrete - East Mine Site

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.15	0 - 0.15	0 - 0.15	
LAB ID			S2006-10998	S2006-10999	S2006-11000	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	EM-CONC 1	EM-CONC 2	EM-CONC 3	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			09-Sep-06	09-Sep-06	09-Sep-06	COMMERCIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	12.9	27.1	29.0 (28.5)	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-8: PCBs in Oil (Swab Sample) - East Mine Site

		DATA		GUIDELINES
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10997 EM- SWAB 09-Sep-06	U.S. EPA 1987 PCB Spill Clean-up Policy (40 CFR 761.12)
PARAMETERS	MDL (µg/100 cm^2)	(µg/100 cm^2)	(µg/100 cm^2)	(µg/100 cm^2)
Polychlorinated Biphenyls	0.008	<0.008	**40.9**	**10**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED

Table 3-9: BTEX/TPH in Soil - East Mine Site

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			0 - 0.25	0 - 0.25	0 - 0.3	0 - 0.9	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-10630	S2006-10651	S2006-10631	S2006-10634	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	EM-TP2-SS1	DUP 8	EM-TP3-SS1	EM-TP6-SS1	COMMERCIAL SITES			
DATE (D/M/Y)			09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<100 ***	161	115	66	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	1540	3150	1730	900	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<1650	<3320	<1860	<976	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil				

Notes:

MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 8 is a blind field duplicate of soil sample EM-TP2-SS1
*** Higher MDL reported due to sample dilution factor

Table 3-10: BTEX/TPH in Soil - East Mine Site

		DATA				GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 0.9	0 - 0.2	3.0 - 4.0	0 - 0.8	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10636	S2006-10637	S2006-10638	S2006-10639	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		EM-TP8-SS1	EM-TP9-SS1	EM-TP10-SS4	EM-TP11-SS1	COMMERCIAL SITES			
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	54	<10	<10	31	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	293	<50	<50	160	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<357	<70	<70	<201	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil	-	-	Chromatogram resembles heavy oil				

Notes:

MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 3-11: BTEX/TPH in Soil - East Mine Site

		DATA				GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 0.75	0 - 0.9	0.5 - 1.0	0 - 0.3	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10640	S2006-10641	S2006-10642	S2006-10643	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		EM-TP12-SS1	EM-TP13-SS1	EM-TP14-SS1	EM-TP15-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	129	69	<10	793	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	761	<50	<50	3320	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<900	<129	<70	<4120	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles weathered diesel	-	Chromatogram resembles diesel and heavy oil				

Notes:

MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 3-12: Metals in Soil - East Mine Site

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0 - 0.9 S2006-10634 EM-TP6-SS1 09-Sep-06	0 - 0.9 S2006-10636 EM-TP8-SS1 09-Sep-06	0 - 0.2 S2006-10637 EM-TP9-SS1 09-Sep-06	3.0 - 4.0 S2006-10638 EM-TP10-SS4 09-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	8310	17200	25	19100	**-**
Antimony	0.5	<0.5	0.9	1.7	2.3	1.4	**40**
Arsenic	0.5	<0.5	3.8	**23.6**	**24.7**	3.8	**12**
Barium	0.5	<0.5	15.4	23.0	13.0	32.1	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	0.2	0.8	0.6	0.2	**-**
Cadmium	0.5	<0.5	<0.5	1.0	0.8	<0.5	**22**
Calcium	25	<25	865	19400	4730	2220	**-**
Chromium	1	<1	65	**98**	73	**113**	**87**
Cobalt	1	<1	10	27	16	22	**300**
Copper	1	<1	**155**	**1740**	**767**	**184**	**91**
Iron	5	<5	22100	47400	37900	39700	**-**
Lead	5	<5	<5	26	46	7	**600**
Magnesium	10	<10	8030	18100	15200	17600	**-**
Manganese	1	<1	156	552	517	507	**-**
Mercury	0.01	<0.01	<0.01	0.04	0.08	<0.01	**50**
Molybdenum	2	<2	<2	2	2	<2	**40**
Nickel	5	<5	19	49	42	40	**50**
Phosphorus	5	<5	355	491	505	588	**-**
Potassium	10	<10	451	542	485	1040	**-**
Selenium	0.1	<0.1	0.1	0.7	0.7	<0.1	**3.9**
Silver	0.25	<0.25	<0.25	0.32	0.39	<0.25	**40**
Sodium	25	<25	204	169	137	180	**-**
Vanadium	5	<5	31	53	53	69	**130**
Zinc	2	<2	26	200	232	60	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-13: Metals in Soil - East Mine Site

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.8	0 - 0.75	0 - 0.9	0 - 0.9	0 - 0.3	
LAB ID		S2006-10639	S2006-10640	S2006-10641	S2006-10653	S2006-10643	
FIELD ID		EM-TP11-SS1	EM-TP12-SS1	EM-TP13-SS1	DUP 10	EM-TP15-SS1	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	10200	25600	15500	16200	20200	-
Antimony	0.5	8.2	3.4	1.5	1.4	2.7	**40**
Arsenic	0.5	**186**	**39.0**	**17.6**	**17.8**	**20.9**	**12**
Barium	0.5	41.7	14.8	21.0	20.9	37.1	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	3.5	1.0	0.6	0.5	1.4	-
Cadmium	0.5	1.2	0.6	<0.5	<0.5	0.8	**22**
Calcium	25	819	609	3020	2680	412	-
Chromium	1	67	**203**	35	34	**189**	**87**
Cobalt	1	7	10	20	20	13	**300**
Copper	1	**1280**	**19500**	**249**	**262**	**1980**	**91**
Iron	5	53500	95300	47300	51600	81000	-
Lead	5	**486**	50	13	13	**439**	**600**
Magnesium	10	10100	27500	12100	12300	20900	-
Manganese	1	163	437	431	450	399	-
Mercury	0.01	2.54	0.58	0.16	0.10	0.46	**50**
Molybdenum	2	13	7	2	2	13	**40**
Nickel	5	15	29	13	13	32	**50**
Phosphorus	5	436	648	734	772	535	-
Potassium	10	2660	743	680	637	765	-
Selenium	0.1	**13.2**	<0.1	0.2	0.9	**10.1**	**3.9**
Silver	0.25	0.69	0.65	<0.25	<0.25	1.25	**40**
Sodium	25	303	212	236	119	218	-
Vanadium	5	62	109	95	94	73	**130**
Zinc	2	101	126	112	108	192	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 10 is a blind field duplicate of soil sample EM-TP13-SS1

Table 3-14: Lead in Soil - East Mine Site

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.25	0 - 0.3	
LAB ID			S2006-10630	S2006-10631	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	EM-TP2-SS1	EM-TP3-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			09-Sep-06	09-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Lead	5.0	<5.0	23.0	39.0	**600**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-15: PAHs in Soil - East Mine Site

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	0 - 0.9 S2006-10636 EM-TP8-SS1 09-Sep-06	3.0 - 4.0 S2006-10638 EM-TP10-SS4 09-Sep-06	0 - 0.8 S2006-10639 EM-TP11-SS1 09-Sep-06	0 - 0.75 S2006-10640 EM-TP12-SS1 09-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-16: PCBs in Soil - East Mine Site

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.3	0 - 0.3	0.6 - 1.2	0 - 0.8	
LAB ID			S2006-10629	S2006-10652	S2006-10632	S2006-10633	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	EMTP1-SS1	DUP 9	EMTP4-SS2	EMTP5-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.005	0.131	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-17: PCBs in Soil - East Mine Site

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.9	0 - 1.0	3.0 - 4.0	0 - 0.8	
LAB ID		S2006-10634	S2006-10635	S2006-10638	S2006-10639	1999 CCME RECOMMENDED
FIELD ID		EMTP6-SS1	EMTP7-SS1	EMTP10-SS4	EMTP11-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	0.015	<0.005 (<0.005)	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-18: PCBs in Soil - East Mine Site

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.75	0 - 0.9	0 - 0.3	0 - 0.3	
LAB ID		S2006-10640	S2006-10641	S2006-10643	S2006-10644	1999 CCME RECOMMENDED
FIELD ID		EMTP12-SS1	EMTP13-SS1	EMTP15-SS1	EMTP16-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	0.199	6.21	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-19: Modified Acid-Base Accounting for Waste Rock - East Mine Site

Lab ID	Sample ID	TOC	Paste pH	Total Sulphur	Sulfate	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
				%	%	%	Kg $CaC0_3$/tonne			
63743-01	EM WR1	0.08	6.7	0.843	0.125	0.718	26.3	37.7	11.3	1.43

Notes:
TOC: Total Organic Carbon
The modified acid-base accounting was determined by the modified Sobek method
Percent Sulfide is calculated by subtracting the Percent Sulfate from Total Percent Sulphur
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer

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APPENDICES

4.0 AREA C – BIG RAMBLER POND MINE

4.1 SITE DESCRIPTION

The Big Rambler Pond Mine is located adjacent to Big Rambler Pond, approximately 2 km southeast of the Rambler Main Mine. The Site consists primarily of an open pit and access road (refer to Figure 4.1, Appendix A-4 and Photos 1 and 2, Appendix B-4). There is a narrow, shallow stream present at the Site that extends in a northerly direction from the open pit into the waters of Big Rambler Pond, located approximately 100 m downgradient of the open pit (refer to Figure 4.1, Appendix A-4 and Photo 3, Appendix B-4).

4.2 PREVIOUS ENVIRONMENTAL INVESTIGATION

A review of the Phase I ESA completed at the Site in March 2005 revealed the following potential environmental concerns at the Big Pond Rambler Mine:

- Potential for impacts to surface water and sediment due to the potential presence of acid generating waste rock at the Site; and
- Metal debris was identified at the Site.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation, consisting of collecting surface water and sediment samples, was recommended to assess the presence/absence of environmental impacts at the Site.

4.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). The following information and observations were recorded by AMEC at the time of the initial site inspection:

- The open pit was full of reddish colour water at the time of the inspection, an indicator of acid rock drainage (ARD) impacts;
- The small stream that extends from the open pit to Big Rambler Pond also appeared to be impacted by ARD;
- Piles of potential acid generating (PAG) waste rock were observed around the edges of the pit and in the surrounding areas (i.e. access road area);

- Metal debris, consisting of aluminum siding and two haulage truck boxes were observed northeast of the open pit (refer to Figure 4.1, Appendix A-4 and Photo 4, Appendix B-4); and
- Several cottages are located in the immediate vicinity of the Site (refer to Figure 4.1, Appendix A-4 and Photo 3, Appendix B-4).

4.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

4.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one sediment sample (BRP-SED1) along the shoreline of Big Rambler Pond at the discharge point of the small stream that extends from the open pit for metals plus hydrides and pH analyses;
- Collecting one surface waste sample (BRP-SW1) along the shoreline of Big Rambler Pond at the discharge point of the small stream that extends from the open pit and a second surface water sample (BRP-SW2) from the open pit for metals and general water chemistry analyses;
- Collecting two waste rock samples (BRP-WR1 and BRP-WR2) at the Site for acid base accounting (ABA) analyses;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 4.2, Appendix A-4.

4.4.2 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix C-4.

4.4.3 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Big Rambler Pond Mine is outlined in Table 4-1 below.

Table 4-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Sediment	BRP-SED1	Metals Plus Hydrides and pH
Surface Water	BRP-SW1, BRP-SW2	Metals Plus Hydrides and General Water Chemistry
Waste Rock	BRP-WR1, BRP-WR2, DUP-2	Acid Base Accounting

Notes:
DUP-2 is a blind field duplicate of waste rock sample BRP-WR2

4.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for surface water, sediment and waste rock samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix D-4. Sample locations are presented on Figure 4.2, Appendix A-4 and the Laboratory Certificates of Analyses are presented in Section 13.0.

4.5.1 Sediment Sample Results

4.5.1.1 Metals in Sediment

One sediment sample (BPR-SED1) collected from Big Pond Rambler was analyzed for metals plus hydrides. The analytical results are presented in Table 4-1, Appendix D-4. The results are compared to the CCME Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments.

Concentrations of metals in sediment sample that exceeded the applicable CCME guidelines for freshwater sediments are as follows:

- Chromium (152 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (3,180 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg); and
- Lead (81 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg).

4.5.1.2 pH in Sediment

One sediment sample (BPR-SED1) collected from Big Pond Rambler was analyzed for pH. The analytical results are presented in Table 4-2, Appendix D-4. Since there are no the CCME-ISQGs and CCME-PELs for pH in freshwater sediments, for comparison purposes, the results were assessed based on acidic (0 to 7) and basic (7 to 14) conditions.

The value of pH detected in sediment sample BPR-SED1 (4.6) was less than 7.0, which indicate acidic sediment conditions at this area of the pond.

4.5.2 Surface Water Sample Results

4.5.2.1 Metals in Surface Water

One surface water sample (BRP-SW1) collected along the shoreline of Big Rambler Pond at the discharge point of the small stream that extends for the open pit and a second surface water sample (BRP-SW2) from the open pit was analyzed for metals plus hydrides. The analytical results are presented in Table 4-3, Appendix D-4. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of aluminum (0.369 mg/L), cadmium (0.000051 mg/L), chromium (0.002 mg/L), copper (0.066 mg/L) and iron (1.0 mg/L) detected in surface water sample BRP-SW1 exceeded the applicable CCME-FAL guidelines.

Concentrations of aluminum (0.653 mg/L), cadmium (0.000061 mg/L), chromium (0.004 mg/L), copper (0.195 mg/L) and iron (1.33 mg/L) detected in surface water sample BRP-SW2 exceeded the applicable CCME-FAL guidelines.

4.5.2.2 General Water Chemistry in Surface Water

One surface water sample (BRP-SW1) along the shoreline of Big Rambler Pond at the discharge point of the small stream that extends for the open pit and a second surface water sample (BRP-SW2) from the open pit was analyzed for general water chemistry. The analytical results are presented in Table 4-4, Appendix D-4. The results are compared to the CCME-FAL guidelines (revised 2005).

The value of pH detected in surface water samples RPF-SW1 (5.67) and RPF-SW2 (5.63) was less than the applicable CCME-FAL guideline of 6.5 to 9.0. These results indicate that surface water at the locations tested is acidic.

4.5.3 Waste Rock Sample Results

4.5.3.1 ABA Results

Two waste rock sample (BRP-WR1 and BRP-WR2), plus one blind field duplicate sample (DUP-2) collected at the Site was analyzed for ABA using the Modified Sobek Testing Method. The difference between the two values, Acid Potential (AP) and Neutralizing Potential (NP), is the rock's Net Neutralization Potential (Net NP). A negative Net NP indicates that the rock is acid producing. The analytical results are presented in Table 4-5, Appendix D-4.

The analytical results revealed a negative value for Net NP for all waste rock samples analyzed and therefore indicate that the waste rock sampled are net acid producers. The NP/AP ratio for both rock samples analyzed was less than 4.0 and therefore should be considered PAG, given a safety factor of 4.0 (Price, 1997).

4.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

4.6.1 Metals

Sediment
Concentrations of metals (i.e. chromium, copper and lead) detected in sediments collected from Big Rambler Pond exceeded the applicable assessment criteria for metals for metals in freshwater sediment.

Surface Water
Concentrations of metals (i.e. aluminum, cadmium, chromium, copper and lead) detected in surface water collected from both the open pit and Big Rambler Pond exceeded the applicable FAL guidelines.

4.6.2 pH

Sediment
Analysis of the sediment sample collected from Big Rambler Pond revealed acidic conditions with a pH value of 4.6.

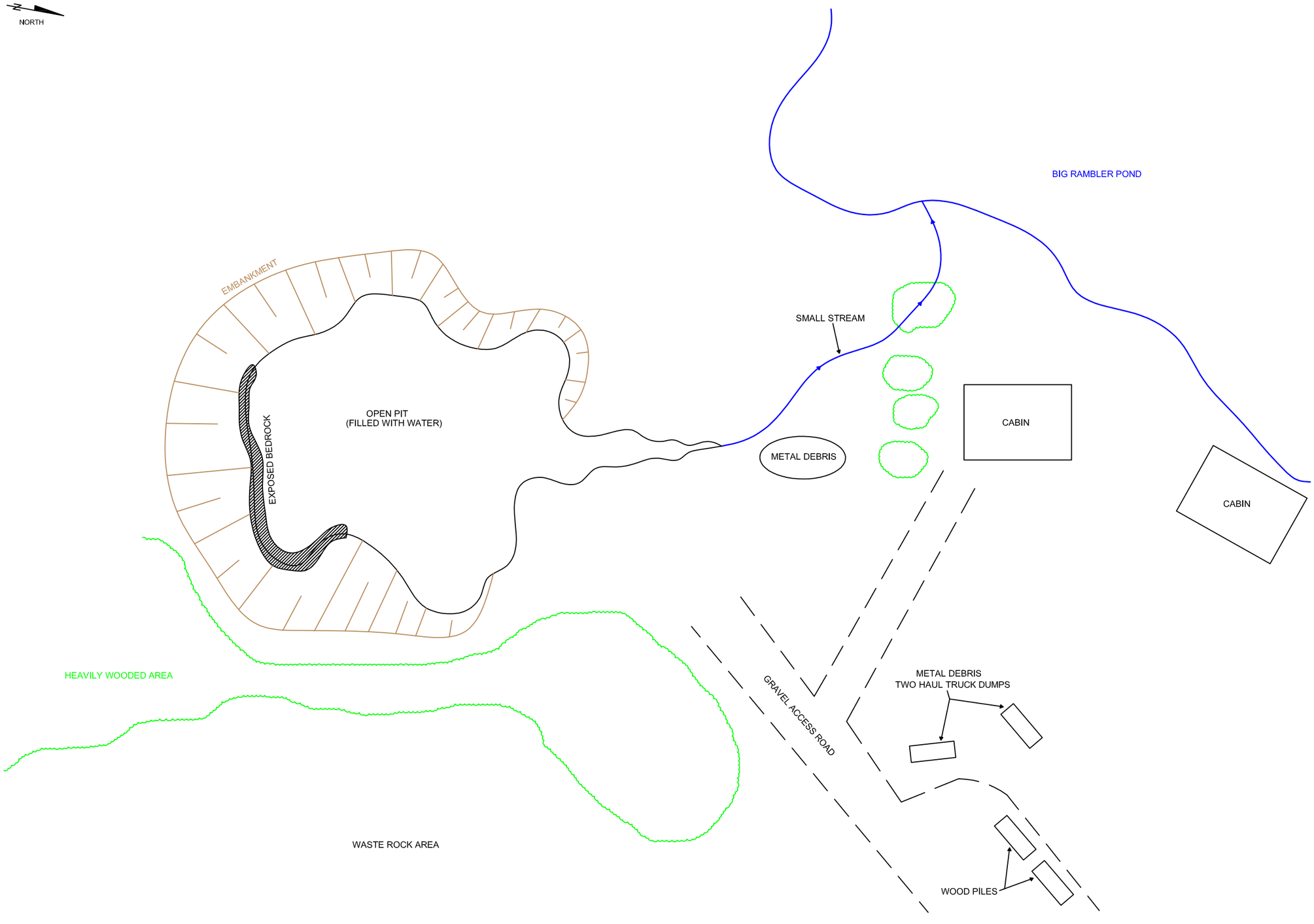
Surface Water
Values of pH detected in surface water collected from both the open pit (5.67) and Big Rambler Pond (5.63) were lower than the applicable FAL guideline of 6.5 to 9.0, indicating acidic water conditions.

4.6.3 PAG Waste Rock

The ABA analyses indicated that the waste rock present at the Site is PAG. The waste rock present at the Site was not buried at the time of the current investigation, but exposed the elements, air and water. Given these conditions, waste rock present at the Site will likely continue to produce acid and therefore have an impact on the surrounding environment.

APPENDIX A-4

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

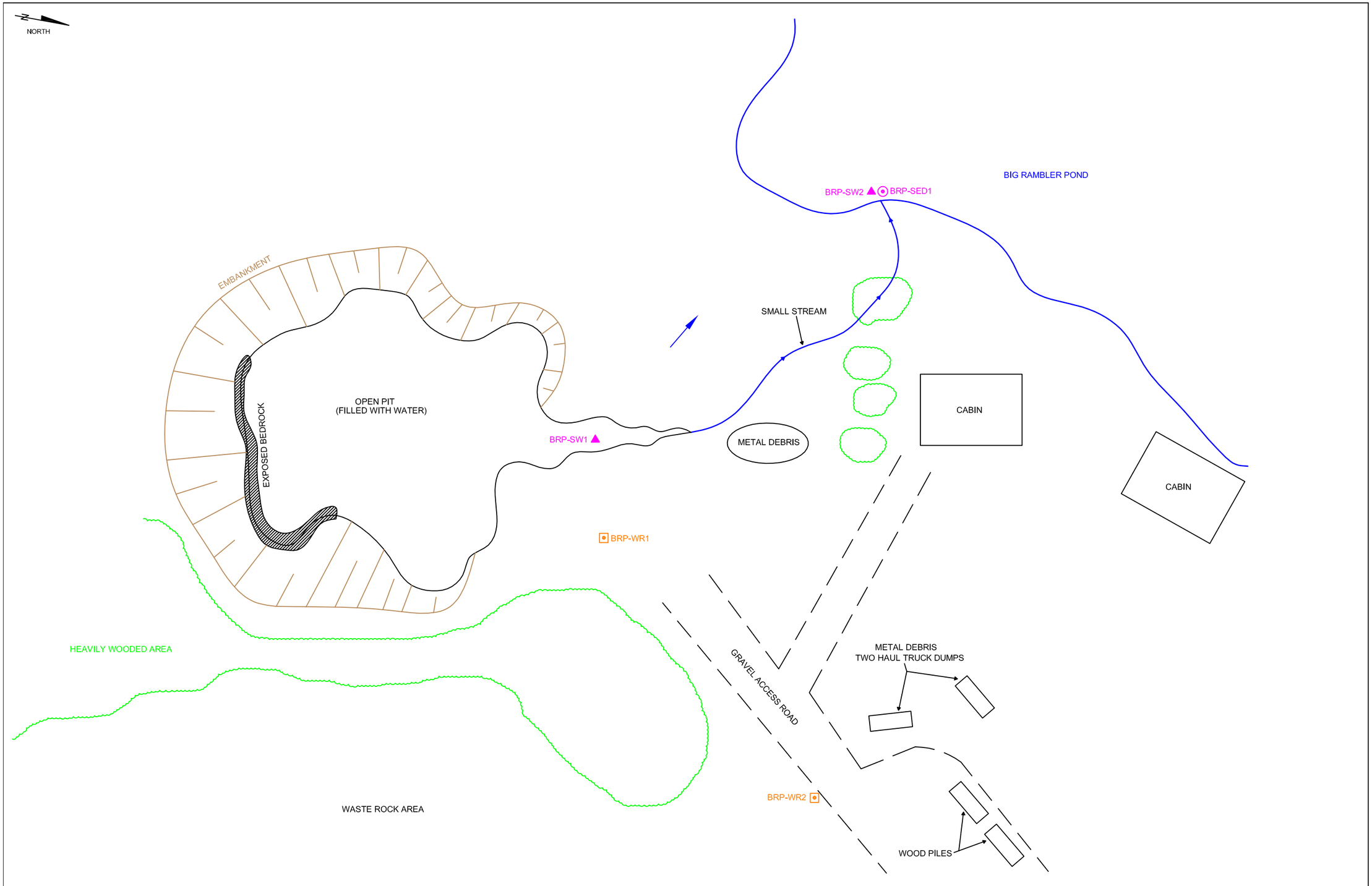
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

BIG RAMBLER POND MINE

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
4.1	January 2007	



NOTES

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LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- SURFACE WATER SAMPLE LOCATION
- SEDIMENT SAMPLE LOCATION
- WASTE ROCK SAMPLE

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

BIG RAMBLER POND MINE
SAMPLE LOCATIONS

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
4.2	January 2007	

APPENDIX B-4

PHOTOGRAPHIC RECORD

Photo 1: Access Road to Big Rambler Pond Mine.
(Note the Potential Acid Generating Waste Rock)

Photo 2: Open Pit – Filled with Water.
(Note the Potential Acid Generating Waste Rock)

Photo 3: Onsite Stream Leading to Big Rambler Pond.
(Note Cabin in Background)

Photo 4: Typical Metal Debris.

APPENDIX C-4

GPS COORDINATES

GPS COORDINATES - NAD27 - BIG RAMBLER POND MINE

Location	Northing	Easting
BPR-SED1	564368	5525605
BPR-SW1	564368	5525605
BPR-SW2	564947	5525532
BPR-WR1	564936	5525540
BPR-WR2	564986	5525620

APPENDIX D-4

LABORATORY ANALYSES TABLES

Table 4-1: Metals Plus Hydrides in Freshwater Sediment - Big Rambler Pond Mine

		DATA		GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10917 BRP-SED1 12-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	27800	-	-
Antimony	0.5	<0.5	3.3	-	-
Arsenic	0.5	<0.5	2.3	**5.9**	**17**
Barium	0.5	<0.5	26.5	-	-
Beryllium	0.2	<0.2	<0.2	-	-
Bismuth	0.2	<0.2	1.6	-	-
Cadmium	0.5	<0.5	<0.5	**0.6**	**3.5**
Calcium	25	<25	3890	-	-
Chromium	1	<1	**152**	**37.3**	**90**
Cobalt	1	<1	35	-	-
Copper	1	<1	**3180**	**37.5**	**197**
Iron	5	<5	123000	-	-
Lead	5	<5	**81**	**35**	**91.3**
Magnesium	10	<10	11300	-	-
Manganese	1	<1	668	-	-
Mercury	0.01	<0.01	0.04	**0.17**	**0.486**
Molybdenum	2	<2	5	-	-
Nickel	5	<5	34	-	-
Phosphorus	5	<5	553	-	-
Potassium	10	<10	80	-	-
Selenium	0.1	<0.1	1.5	-	-
Silver	0.25	<0.25	<0.25	-	-
Sodium	25	<25	237	-	-
Vanadium	5	<5	50	-	-
Zinc	2	<2	76	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 4-2: pH in Freshwater Sediment - Big Rambler Pond Mine

		DATA		GUIDELINES	
LAB ID			S2006-10917	1999 CCME RECOMMENDED	
FIELD ID		Lab Blank	BRP-SED1	SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
DATE (D/M/Y)			06-Sep-06	ISQG	PEL
PARAMETERS	MDL	-	-	-	-
pH	-	6.3	4.6	**-**	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED

Table 4-3: Metals Plus Hydrides in Surface Water - Big Rambler Pond Mine

		DATA			GUIDELINES
LAB ID		Lab Blank	S2006-10868	S2006-10869	CCME-CEQGs
REPORT ID			BRP-SW1	BRP-SW2	(REVISED 2005)
DATE			12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**0.369**	**0.653**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	<0.001	**0.005**
Barium	0.001	<0.0005	0.005	0.004	**-**
Beryllium	0.001	<0.0001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.000051**	**0.000061**	**0.000017**
Calcium	0.5	<0.5	1.4	2.8	**-**
Chromium	0.001	<0.001	**0.002**	**0.004**	**0.001**
Cobalt	0.001	<0.001	0.004	0.010	**-**
Copper	0.001	<0.001	**0.066**	**0.195**	**0.002-0.004**
Iron	0.01	<0.001	**1.00**	**1.33**	**0.3**
Lead	0.002	<0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	<0.02	0.90	1.27	**-**
Manganese	0.001	<0.001	0.059	0.131	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	0.003	0.006	**0.025-0.15**
Phosphorus	0.02	<0.002	<0.02	<0.02	**-**
Potassium	0.02	<0.02	0.23	0.26	**-**
Selenium	0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Sodium	0.5	<0.5	2.4	2.9	**-**
Vanadium	0.005	<0.002	<0.005	<0.005	**-**
Zinc	0.005	<0.001	0.008	0.021	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 4-4: General Water Chemistry in Surface Water - Big Rambler Pond Mine

		DATA			GUIDELINES
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10868 BRP-SW1 12-Sep-06	S2006-10869 BRP-SW2 12-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	Units				
Ammonia	(mg/L)	<0.01	<0.01	<0.01	-
Chloride	(mg/L)	<0.1	3.6	4.3	-
Conductivity	(µS/cm)	<5	33	41	-
Fluoride	(mg/L)	<0.1	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	7.2	12.2	-
Nitrate as N	(mg/L)	<0.05	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	**0.06**
pH		7.86	**5.67**	**5.63**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001	0.001	**0.004**
Sulphate	(mg/L)	<0.1	3.7	7.1	-
Total Alkalinity (CaCO3)	(mg/L)	<5	5	5	-
Total Dissolved Solids	(mg/L)	<10	87	56	-
Total Suspended Solids	(mg/L)	<2	<2	5	-
Cation Balance	(meq)	-	0.25	0.37	-
Anion Balance	(meq)	-	0.28	0.37	-
Ion Balance	(%)	-	-4.92	0.42	-
Calcium	(mg/L)	<0.5	1.4	2.8	-
Magnesium	(mg/L)	<0.02	0.90	1.27	-
Potassium	(mg/L)	<0.02	0.23	0.26	-
Sodium	(mg/L)	<0.5	2.4	2.9	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designatior
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 4-5: Modified Acid-Base Accounting for Waste Rock - Big Rambler Pond Mine

Lab ID	Sample ID	TOC	Paste pH	Total Sulphur	Sulfate	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AR
				%	%	%	Kg $CaC0_3$/tonne			
63743-18	BRP-WR1	<0.05	6.8	1.29	0.035	1.255	40.3	16.8	-23.5	0.4
63743-19	BRP-WR2	<0.05	6.8	1.13	0.073	1.057	35.3	2.7	-32.6	0.1
63743-25	DUP-2	0.06	5.6	2.45	0.096	2.354	76.6	-1.0	-77.5	0.0

Notes:
TOC: Total Organic Carbon
The modified acid-base accounting was determined by the Sobek method
Percent Sulfide is calculated by subtracting the Percent Sulfate from Total Percent Sulphur
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer
DUP-2 is a blind field duplicate of waste rock sample BRP-WR2

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APPENDICES

5.0 AREA D – TAILINGS AREA

5.1 SITE DESCRIPTION

The main feature at this area of the Site is a large mass of tailings, approximately 1.5 km long x 0.5 km wide, subaerially exposed in the Rambler Pond Basin (refer to Figure 5.1, Appendix A-5 and Photos 1 and 2, Appendix B-5). Other features present at the tailings area include two spillways, two diversion ditches (north and west), a monitoring station, Muskrat Pond, Little Rambler Pond and Beaverhouse Pond.

5.2 PREVIOUS ENVIRONMENTAL INVESTIGATION

A review of the Phase I ESA completed at the Site in March 2005 revealed the following potential environmental concerns at the Tailings Area:

- There is approximately 2,000,000 tonnes of acid generating tailings present at the Site;
- The regulatory review uncovered details of impacts to watercourses downstream of the Tailings Area, including South Brook. Reportedly, these impacts have caused fish mortality in the area. Numerous studies conducted by Environment Canada indicate that the concentrations of metals and low pH in surface water at the Site and downgradient streams are acutely lethal to rainbow trout and salmon; and
- A total of nine surface water samples collected from nearby water bodies and South Brook by the DNRMD in 2002 were analyzed for pH and cyanide. Results revealed values of pH between 2 and 5 in all surface water samples analyzed. Results also revealed a significantly high concentration of cyanide (220 mg/L) in one surface water sample collected from a body of standing water at the base of the liner of Raymo tailings pile, which was later determined to be a false analytical reading due to thiocyanate interference. A second surface water sample was collected at the base of the Raymo tailings pile in 2003 and the resultant laboratory analytical testing revealed that cyanide was not detected (<0.002 mg/L) in the sample.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation, consisting of a series of test pits and monitoring wells and the subsequent collection of groundwater, surface water, sediment and tailing samples, was recommended to assess the presence/absence of environmental impacts at the Site.

5.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with a Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site

representative). A second site inspection was conducted by Steve Sibbick, P.Geo. of AMEC on September 19, 2006. The following information and observations were recorded by AMEC at the time of the site inspections:

- Site appears to be covered with extensive deposits of acid generating tailings (refer to Figure 5.1, Appendix A-5 and Photos 1 and 2, Appendix B-1);
- Many of the engineered structures constructed at the Site to contain and/or manage the mine wastes and waters are either inadequate or have failed;
- The Wooden Spillway located at the northwest corner of the Tailings Pond has collapsed and impacted water flows uncontained/untreated from the Tailings Pond into South Brook (refer to Figure 5.1, Appendix A-5 and Photo 3, Appendix B-5);
- Widespread iron-stained rocks were observed throughout South Brook (refer to Photo 4, Appendix B-5);
- Flow from England's Steady has been diverted around the tailings via the North Diversion Ditch (refer to Figure 5.1, Appendix A-5);
- At one location, the water elevation within the North Diversion Ditch is approximately 3 m higher than the natural ground surface on the downgradient side of the dam. Failure of the dam here would cause the England's Steady to drain into the tailings, likely with a significant impact to the tailings and the impoundment;
- The North Diversion Ditch appears to be significantly impacted by acid rock drainage (ARD) (refer to Photo 5, Appendix B-5);
- A series of lined berms/dams have been used to direct the flow around Muskrat Pond;
- Muskrat Pond flows southwards into the tailings through a collapsed section of the berm (i.e. Breach) (refer to Figure 5.1, Appendix A-5 and Photos 6 and 7, Appendix B-5);
- The dyke separating Little Rambler Pond and the Tailings Pond has failed and water from Little Rambler Pond flows into the Tailings Pond;
- Drainage through the Monitoring Station, between Muskrat Pond and the Tailings Pond, had minimal flow (refer to Figure 5.1, Appendix A-5 and Photo 8, Appendix B-5);
- There was no discharge from the Spillway to Muskrat Pond, although it appeared that there had been water flow during higher flow periods (refer to Figure 5.1, Appendix A-5 and Photo 9, Appendix B-5);
- Flow from Beaverhouse Pond appeared to flow over the tailings into the Tailings Pond (refer to Figure 5.1, Appendix A-5);
- One pole-mounted transformer was observed along the "Hydro Cut Lines", north of Muskrat Pond (refer to Figure 5.1, Appendix A-5 and Photo 10, Appendix B-5);
- Three existing groundwater standpipes were observed along the northern edge to the Tailings (refer to Figure 5.1, Appendix A-5 and Photo 11, Appendix B-5); and
- No evidence of natural re-vegetation was observed on the tailings.

5.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD TOR dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Phase II ESA Proposed Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspections carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

5.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one paint chip sample (TAIL-PS1) from the green painted surfaces of the Monitoring Station for lead and mercury analyses;
- Collecting one surface soil sample (TAIL-TP1) from underneath a pole-mounted transformer identified at the Site for PCB analysis;
- Installing three boreholes/monitoring wells (TAIL-MW1 to TAIL-MW3) downgradient and north of the Tailings and Tailing Pond and collecting groundwater samples for general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting groundwater samples from three existing standpipes (MW1, MW3 and MW4) identified at the Site for general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting 14 surface water samples (TAIL-SW1 to TAIL-SW11 and LRP-SW1 to LRP-SW3) throughout the Site for general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting nine sediment samples (TAIL-SED1 to TAIL-SED8 and LRP-SED1) throughout the Site for metal plus hydrides, total cyanide and pH analyses;
- Collecting four samples (TAIL-TL1 to TAIL-TL4) from the tailings present at the Site for metals plus hydrides, total cyanide, pH and acid base accounting (ABA) analyses;
- Recording GPS coordinates for all sample locations;
- Gauging the newly installed monitoring wells and existing standpipes present at the Site using an oil/water interface probe and recording static groundwater depths and free phase petroleum hydrocarbon levels (if present); and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 5.2, Appendix A-5.

5.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, groundwater elevations, groundwater flow direction and contaminant observations are discussed in this section.

5.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness dark brown sand and gravel with some organics, boulders and cobbles and trace silt. A layer of dark brown mud/peat type material (i.e. bog) was detected borehole/monitoring well TAIL-MW1 at a depth of 0 to 0.6 m below the ground surface (bgs). Possible glacial till, consisting of grey sand and gravel with some boulders and cobbles was detected in borehole/monitoring well TAIL-MW3 at a depth of 0.6 to 1.8 m bgs. Thickness of the overburden present at the Site ranged from 1.8 (TAIL-MW2, TAIL-MW3) to at least 3.3 m bgs (TAIL-MW1). Detailed soil descriptions and sampling depths are provided in the borehole/monitoring well logs presented in Appendix C-5.

5.4.2.2 Groundwater Conditions

Groundwater Elevations and Flow Direction

All monitoring wells were gauged using a Heron™ oil/water interface meter to determine static groundwater levels. The groundwater level measurements indicate that the groundwater is located between 1.80 m to 2.0 m bgs. Based on the topography, groundwater flow direction is estimated to be in a northerly direction, towards Route 414.

Field pH, Temperature and Specific Conductance

During purging of monitoring wells TAIL-MW1 to TAIL-MW3 and standpipes MW1, MW3 and MW4, the pH, temperature and specific conductance of the groundwater being removed from the wells and standpipes were monitored to ensure that representative samples of groundwater were collected. Field pH, temperature and specific conductance data are presented in Appendix D-5.

5.4.2.3 Contaminant Observations

Petroleum Hydrocarbon Odours

No petroleum hydrocarbon odours were observed in any of the soil, groundwater, surface water, sediment and tailings samples collected at the Site during the current investigation.

Free Phase Petroleum Hydrocarbon Product

Monitoring wells TAIL-MW1 to TAIL-MW3 and standpipes MW1, MW3 and MW4 were gauged using a Heron™ oil/water interface meter to measure the thickness of free phase petroleum hydrocarbon product on the water table at the Site (if present). No free phase petroleum hydrocarbon product was detected in any of the monitoring well and standpipes at the time of the current investigation.

5.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-5.

5.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Tailings Area is outlined in Table 5-1 below.

Table 5-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	TAIL-PS1	Lead and Mercury
Soil	TAIL-TP1	PCB
Groundwater	TAIL-MW1, TAIL-MW2, TAIL-MW3, MW1, MW3, MW4, DUP E	Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Sediment	TAIL-SED1, TAIL-SED2, TAIL-SED2, TAIL-SED4, TAIL-SED5, TAIL-SED6, TAIL-SED7, TAIL-SED8, LRP-SED1, DUP A	Metals Plus Hydrides, Total Cyanide and pH
Surface Water	TAIL-SW1, TAIL-SW2, TAIL-SW3, TAIL-SW4, TAIL-SW5, TAIL-SW6, TAIL-SW7, TAIL-SW8, TAIL-SW9, TAIL-SW10, TAIL-SW11, LRP-SW1, LRP-SW2, LRP-SW3, DUP D	Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Tailings	TAIL-TL1, TAIL-TL2, TAIL-TL3, TAIL-TL4	Metals Plus Hydrides, Total Cyanide, pH and Acid Base Accounting

Notes:
DUP A is a blind field duplicate of sediment sample TAIL-SED7 for metals plus hydrides and pH analyses
DUP D is a blind field duplicate of surface water sample TAIL-SW9 for metals plus hydrides, general water chemistry and total cyanide analyses
DUP E is a blind field duplicate of groundwater sample TAIL-MW1 for metals plus hydrides, general water chemistry and total cyanide analyses

5.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for paint, soil, sediment, surface water groundwater and tailings samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-5. Sample locations are presented on Figure 5.2, Appendix A-5 and the Laboratory Certificates of Analyses are presented in Section 13.0.

5.5.1 Paint Sample Results

5.5.1.1 Lead in Paint

One paint sample (TAIL-PS1) collected from the green painted surfaces of the Monitoring Station present at the Site was submitted to the laboratory for lead analyses. The laboratory result for lead in paint is presented in Table 5-1, Appendix F-5. The result was compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentration of lead (13.2 mg/kg) detected in paint sample TAIL-PS1 did not exceed the Federal HPA criterion of 600 mg/kg or the former Federal HPA criterion of 5,000 mg/kg.

Since the level of lead detected in the sample of green paint collected from the Monitoring Station did not exceed the former Federal HPA criterion of 5,000 mg/kg, this paint, if removed from the Site, may be disposed of at an approved landfill facility. Therefore, leachability testing for lead was not carried out on this paint.

5.5.1.2 Mercury in Paint

One paint sample (TAIL-PS1) collected from the green painted surfaces of the Monitoring Station present at the Site was submitted to the laboratory for mercury analyses. The laboratory result for mercury in paint is presented in Table 5-2, Appendix F-5. The result was compared to the Federal HPA criterion of 10 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that the concentration of mercury (0.021 mg/kg) detected in paint sample TAIL-PS1 did not exceed the Federal HPA criterion of 10 mg/kg.

Since the level of mercury detected in the sample of green paint collected from the Monitoring Station did not exceed the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), this paint, if removed from the Site may be disposed of at an approved landfill facility. Therefore, leachability testing for mercury was not carried out on this paint.

5.5.2 Soil Sample Results

5.5.2.1 PCBs in Soil

One soil sample (TAIL-TP1) collected underneath a pole-mounted transformer identified at the Site was analyzed for PCBs. The analytical result is presented in Table 5-3, Appendix F-5. The result was compared to the CCME-CEQG for industrial sites.

PCBs were not detected (<0.005 mg/kg) in soil sample TAIL-TP1 and therefore is below the applicable assessment criteria of 33 mg/kg.

5.5.3 Groundwater Sample Results

5.5.3.1 Metals in Groundwater

A total of six groundwater samples (TAIL-MW1 to TAIL-MW3, MW1, MW3 and MW4), plus one blind field duplicate sample (DUP E), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 5-4 and 5-5, Appendix F-5. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of metals detected in groundwater that exceeded the applicable CCME-FAL guidelines for metals in groundwater are listed below:

<u>TAIL-MW1</u>

- Aluminum (2.57 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000399 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;

- Chromium (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Iron (3.68 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.017 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.088 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0015 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (12.1 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

DUP E (Blind Field Duplicate of TAIL-MW1)

- Aluminum (6.20 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.008809 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (1.14 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (3.04 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Nickel (0.082 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0005 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (1.96 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-MW2

- Aluminum (0.067 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000093 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Iron (40.5 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.006 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Silver (0.0021 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (0.186 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-MW3

- Aluminum (2.28 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000141 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.030 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (0.055 mg/L) exceeded the CCME-FAL of 0.002 mg/L; and
- Iron 4.17 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

MW1

- Aluminum (0.011 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000061 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.004 mg/L) exceeded the CCME-FAL of 0.002 mg/L; and
- Iron (1.19 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

MW3

- Aluminum (21.0 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.011698 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.049 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (2.36 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (113 mg/L) exceeded the CCME-FAL of 0.3 mg/L;

- Lead (0.025 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.152 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Selenium (0.005 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Silver (0.0007 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (4.37 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

MW4

- Aluminum (0.173 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Arsenic (0.006 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.002174 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (0.021 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (230 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.011 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.033 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Selenium (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Silver (0.0006 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (0.976 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

5.5.3.2 Cyanide in Groundwater

A total of six groundwater samples (TAIL-MW1 to TAIL-MW3, MW1, MW3 and MW4), plus one blind field duplicate sample (DUP E), collected at the Site were analyzed for total cyanide. The analytical results are presented in Tables 5-6 to 5-7, Appendix F-5. The results are compared to the CCME-FAL guideline of 0.005 mg/L.

The concentration of total cyanide detected in groundwater sample MW4 (0.018 mg/L) exceeded the applicable assessment criterion of 0.005 mg/L. Concentrations of total cyanide detected in the remaining groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criterion.

5.5.3.3 General Water Chemistry in Groundwater

A total of six groundwater samples (TAIL-MW1 to TAIL-MW3, MW1, MW3 and MW4), plus one blind field duplicate sample (DUP E), collected at the Site were analyzed for general water chemistry. The analytical results are presented in Tables 5-8 to 5-9, Appendix F-5. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of fluoride detected in groundwater samples TAIL-MW1 (0.2 mg/L) and DUP E (0.2 mg/L) exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

The concentrations of Nitrate as N detected in groundwater sample TAIL-MW3 (0.079 mg/L) exceeded the applicable CCME-FAL guideline of 0.06 mg/L.

Values of pH detected in groundwater samples TAIL-MW1 (4.06), TAIL-MW2 (5.77), MW3 (2.75), MW4 (4.65) and DUP E (3.67) were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater present throughout the majority of the Site is acidic.

5.5.4 Sediment Sample Results

5.5.4.1 Metals in Sediment

A total of nine sediment samples (TAIL-SED1 to TAIL-SED8 and LRP-SED1), plus one blind field duplicate sample (DUP A), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 5-10 to 5-12, Appendix F-5. The results are compared to the CCME Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments.

Concentrations of metals detected in sediment that exceeded the applicable CCME guidelines for freshwater sediments are listed below:

TAIL-SED1
- Arsenic (706 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (14.2 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Copper (2,520 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (152 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg);
- Mercury (4.20 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg); and
- Zinc (1,700 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

TAIL-SED2
- Arsenic (434 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (22.6 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Chromium (112 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (2,300 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (191 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg);
- Mercury (1.88 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg); and
- Zinc (5,540 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

TAIL-SED3
- Chromium (204 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg); and
- Copper (57 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg).

TAIL-SED4
- Chromium (187 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg); and
- Copper (117 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg).

TAIL-SED5

- Arsenic (47.8 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (7.1 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Chromium (178 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (2,380 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (100 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg);
- Mercury (0.28 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg); and
- Zinc (2,330 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

TAIL-SED6

- Arsenic (14.8 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (0.7 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg);
- Chromium (78 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg);
- Copper (1,350 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (60 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg);
- Mercury (0.49 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg); and
- Zinc (389 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

TAIL-SED7

- Arsenic (219 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (1.3 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg);
- Copper (3,560 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (66 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg); and
- Mercury (1.55 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg).

DUP A (Blind Field Duplicate of TAIL-SED7)

- Arsenic (233 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (1.4 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg);
- Copper (3,070 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (62 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg); and
- Mercury (0.22 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg).

TAIL-SED8

- Arsenic (7.6 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg);
- Chromium (118 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg); and
- Copper (150 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg).

LRP-SED1

- Arsenic (66.0 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (0.9 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg);
- Chromium (170 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (1,090 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (63 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg);

- Mercury (60.3 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg); and
- Zinc (195 mg/kg) exceeded the CCME-ISQG (123 mg/kg).

5.5.4.2 Cyanide in Sediment

A total of nine sediment samples (TAIL-SED1 to TAIL-SED8 and LRP-SED1) collected at the Site were analyzed for total cyanide. The analytical results are presented in Tables 5-13 to 5-15, Appendix F-5. Since there are no the CCME-ISQGs PELs for total cyanide in freshwater sediment, this parameter was assessed based on presence/absence.

Total cyanide was detected in all sediment samples analyzed. Concentrations ranged from 0.042 mg/kg (LRP-SED1) to 11.4 mg/kg (TAIL-SED6).

5.5.4.3 pH in Sediment

A total of nine sediment samples (TAIL-SED1 to TAIL-SED8 and LRP-SED1), plus one blind field duplicate sample (DUP A), collected at the Site were analyzed for ph. The analytical results are presented in Tables 5-13 to 5-15, Appendix F-5. Since there are no the CCME-ISQGs and PELs for pH in freshwater sediment, for comparison purposes, the results were assessed based on acidic (0 to 7) and basic (7 to 14) conditions.

Values of pH detected in all freshwater sediment samples analyzed were reported less than 7.0, which indicate acidic sediment conditions throughout the Site. Values of pH detected in sediment ranged from 4.2 (LRP-SED1) to 6.5 (TAIL-SED1).

5.5.5 Surface Water Sample Results

5.5.5.1 Metals in Surface Water

A total of 14 surface water samples (TAIL-SW1 to TAIL-SW11 and LRP-SW1 to LRP-SW3), plus one blind field duplicate sample (DUP D), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 5-16 to 5-19, Appendix F-5. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of metals detected in surface water that exceeded the applicable CCME-FAL guidelines for metals are listed below:

<u>TAIL-SW1</u>

- Aluminum (3.68 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Arsenic (0.05 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.010418 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.009 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (1.11 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (63.4 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.073 mg/L) exceeded the CCME-FAL of 0.001 mg/L;

- Nickel (0.027 mg/L) exceeded the CCME-FAL of 0.025 mg/L; and
- Zinc (5.19 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW2

- Aluminum (4.51 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.012977 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.011 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (1.11 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (61.2 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.089 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.033 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0002 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (5.13 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW3

- Aluminum (3.97 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Arsenic (0.011 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.011488 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.010 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (1.11 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (61.2 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.081 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.029 mg/L) exceeded the CCME-FAL of 0.025 mg/L; and
- Zinc (5.18 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW4

- Aluminum (0.280 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000020 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.003 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (0.69 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Silver (0.0002 mg/L) exceeded the CCME-FAL of 0.001 mg/L.

TAIL-SW5

- Aluminum (0.139 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000171 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (0.024 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (1.82 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Zinc (0.044 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW6

- Aluminum (0.446 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000668 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.211mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (4.94 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and

- Zinc (0.280 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW7

- Aluminum (0.888 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Arsenic (0.007 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000753 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.172 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (1.23 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.006 mg/L) exceeded the CCME-FAL of 0.001 mg/L; and
- Zinc (0.269 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW8

- Aluminum (12.3 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.003613 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.016 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (0.823 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (11.8 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.013 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.072 mg/L) exceeded the CCME-FAL of 0.025 mg/L; and
- Zinc (1.85 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW9

- Aluminum (0.605 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000880 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.275 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (4.35 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Zinc (0.357 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

DUP D (Blind Field Duplicate of TAIL-SW9)

- Aluminum (0.579 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000864 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.255 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (3.89 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Zinc (0.364 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW10

- Aluminum (1.40 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Arsenic (0.007 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.002107 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.959 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (4.85 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Zinc (0.675 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

TAIL-SW11

- Aluminum (0.448 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000343 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.100 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (2.42 mg/L) exceeded the CCME-FAL of 0.3 mg/L; and
- Zinc (0.139 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

LRP-SW1

- Aluminum (0.282 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000032 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.003 mg/L) exceeded the CCME-FAL of 0.002 mg/L; and
- Iron (0.660 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

LRP-SW2

- Aluminum (0.288 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000022 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.003 mg/L) exceeded the CCME-FAL of 0.002 mg/L; and
- Iron (0.62 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

LRP-SW3

- Aluminum (0.299 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000064 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.003 mg/L) exceeded the CCME-FAL of 0.002 mg/L; and
- Iron (0.62 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

5.5.5.2 Cyanide in Surface Water

A total of 14 surface water samples (TAIL-SW1 to TAIL-SW11 and LRP-SW1 to LRP-SW3), plus one blind field duplicate sample (DUP D), collected at the Site were analyzed for total cyanide. The analytical results are presented in Tables 5-20 to 5-23, Appendix F-5. The results are compared to the CCME-FAL guideline of 0.005 mg/L.

Cyanide was not detected in any of the surface water samples analyzed and therefore did not exceed the applicable CCME-FAL guideline of 0.005 mg/L.

5.5.5.3 General Water Chemistry in Surface Water

A total of 14 surface water samples (TAIL-SW1 to TAIL-SW11 and LRP-SW1 to LRP-SW3), plus one blind field duplicate sample (DUP D), collected at the Site were analyzed for general water chemistry. The analytical results are presented in Tables 5-24 to 5-27, Appendix F-5. The results are compared to the CCME-FAL guidelines (revised 2005).

The concentration of fluoride detected in surface water sample TAIL-SW8 (0.3 mg/L) exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

The concentration of phenols detected in surface water sample TAIL-SW5 (0.009 mg/L) exceeded the applicable CCME-FAL guideline of 0.004 mg/L.

Values of pH detected in all surface water samples collected at the Site were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Values of pH detected in surface water samples analyzed ranged from 2.54 (TAIL-SW3) to 5.71 (LRP-SW1). This indicates that surface water present throughout the Site is acidic.

5.5.6 Tailings Sample Results

5.5.6.1 Metals in Tailings

A total of four tailings samples (TAIL-TL1 to TAIL-TL4) collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Table 5-28, Appendix F-5. The results are compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of arsenic detected in tailings samples TAIL-TL1 (387 mg/kg), TAIL-TL2 (229 mg/kg), TAIL-TL3 (166 mg/kg) and TAIL-TL4 (270 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of copper detected in tailings samples TAIL-TL1 (4,390 mg/kg), TAIL-TL2 (6,840 mg/kg), TAIL-TL3 (1,440 mg/kg) and TAIL-TL4 (614 mg/kg) exceeded the applicable CCME-CEQG of 91 mg/kg.

Concentrations of lead detected in tailings samples TAIL-TL2 (1,260 mg/kg), TAIL-TL3 (796 mg/kg) and TAIL-TL4 (704 mg/kg) exceeded the applicable CCME-CEQG of 260/600 mg/kg for lead in soil at a commercial/industrial site. The concentration of lead detected in tailings sample TAIL-TL1 (263 mg/kg) exceeded the applicable CCME-CEQG of 260 for lead in soil at a commercial, but did not exceed the applicable CCME-CEQG of 600 mg/kg for lead in soil at an industrial site.

Concentrations of selenium detected in tailings samples TAIL-TL3 (13.2 mg/kg) and TAIL-TL4 (12.8 mg/kg) exceeded the applicable CCME-CEQG of 3.9 mg/kg.

Concentrations of zinc detected in tailings samples TAIL-TL2 (496 mg/kg) and TAIL-TL4 (681 mg/kg) exceeded the applicable CCME-CEQG of 360 mg/kg.

5.5.6.2 Cyanide in Tailings

A total of four tailings samples (TAIL-TL1 to TAIL-TL4) collected at the Site were analyzed for total cyanide. The analytical results are presented in Table 5-29, Appendix F-5. The results are compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of cyanide in all tailings sample analyzed were detected at levels below the applicable assessment criterion of 8.0 mg/kg. Concentrations of cyanide detected in the tailings samples analyzed ranged from 0.012 mg/kg (TAIL-TL3 and TAIL-TL4) to 0.017 mg/kg (TAIL-TL2).

5.5.6.3 pH in Tailings

A total of four tailings samples (TAIL-TL1 to TAIL-TL4) collected at the Site were analyzed for pH. The analytical results are presented in Table 5-30, Appendix F-5. The results are compared to the CCME-CEQG for commercial/industrial sites.

The values of pH detected in all tailings samples analyzed were less than the applicable CCME-CEQG of 6.5 to 9.0. Values of pH detected in the tailings samples analyzed ranged from 2.2 (TAIL-TL3) to 2.5 (TAIL-TL1). This indicates that tailings present at the Site are acidic.

5.5.6.4 ABA Results in Tailings

A total of four tailings samples (TAIL-TL1 to TAIL-TL4) collected at the Site were analyzed for ABA using the Sobek Testing Method. The difference between the two values, Acid Potential (AP) and Neutralizing Potential (NP), is the rock's Net Neutralization Potential (Net NP). A negative Net NP indicates that the rock is acid producing. The analytical results are presented in Table 5-31, Appendix F-5.

The analytical results revealed a negative value for Net Neutralizing Potential for all tailings samples analyzed and therefore indicate that the tailings are net acid producers. The NP/AP ratio for both rock samples analyzed was less than 4.0 and therefore should be considered PAG, given a safety factor of 4.0 (Price, 1997).

5.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) identified at the Site are provided.

5.6.1 Metals

Concentrations of a combination of metals detected in all six groundwater, fourteen surface water, eight sediment and four tailings samples collected at the Site during the current investigation exceeded the applicable assessment guidelines. Based on the testing completed, metal impacts detected in all media sampled are considered to be widespread throughout the Site.

5.6.2 Cyanide

<u>Groundwater</u>
The concentration of total cyanide (0.018 mg/L) detected one (MW4) of the six groundwater samples collected at the Site during the current investigation exceeded the applicable assessment criterion of 0.005 mg/L. Groundwater sample MW4 was collected from a standpipe located near the Spillway (refer to Figure 5.2, Appendix A-5).

<u>Surface Water, Sediment and Tailings</u>
Concentrations of cyanide detected in all surface water, sediment and tailings samples collected at the Site during the current investigation were either non-detect or detected at levels below the applicable

assessment criteria. Therefore, based on the testing completed, cyanide impacts at this location of the Site are limited to groundwater.

5.6.3 pH

Groundwater

Values of pH (2.75 to 5.77) detected in four (TAIL-MW1, TAIL-MW2, MW3, MW4) of the six groundwater samples collected at the Site during the current investigation were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater present throughout the majority of the Site is acidic.

Sediment

Values of pH detected in all eight freshwater sediment samples analyzed were reported less than 7.0, which indicate acidic sediment conditions throughout the Site. Values of pH detected in sediment ranged from 4.2 (LRP-SED1) to 6.5 (TAIL-SED1). This indicates that sediment present within the various freshwater bodies, tailing ponds and drainage ditches present throughout the Site are acidic.

Surface Water

Values of pH detected in all 14 surface water samples collected at the Site were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Values of pH detected in surface water samples analyzed ranged from 2.54 (TAIL-SW3) to 5.71 (LRP-SW1). The lowest values of pH were detected in the Tailings Pond (2.54 to 2.55) and downgradient of the Spillway (2.71). The highest values of pH were detected in Little Rambler Pond (5.63 to 5.71) and downgradient of the Wooden Spillway (5.56). This indicates that surface water present throughout the Site is acidic.

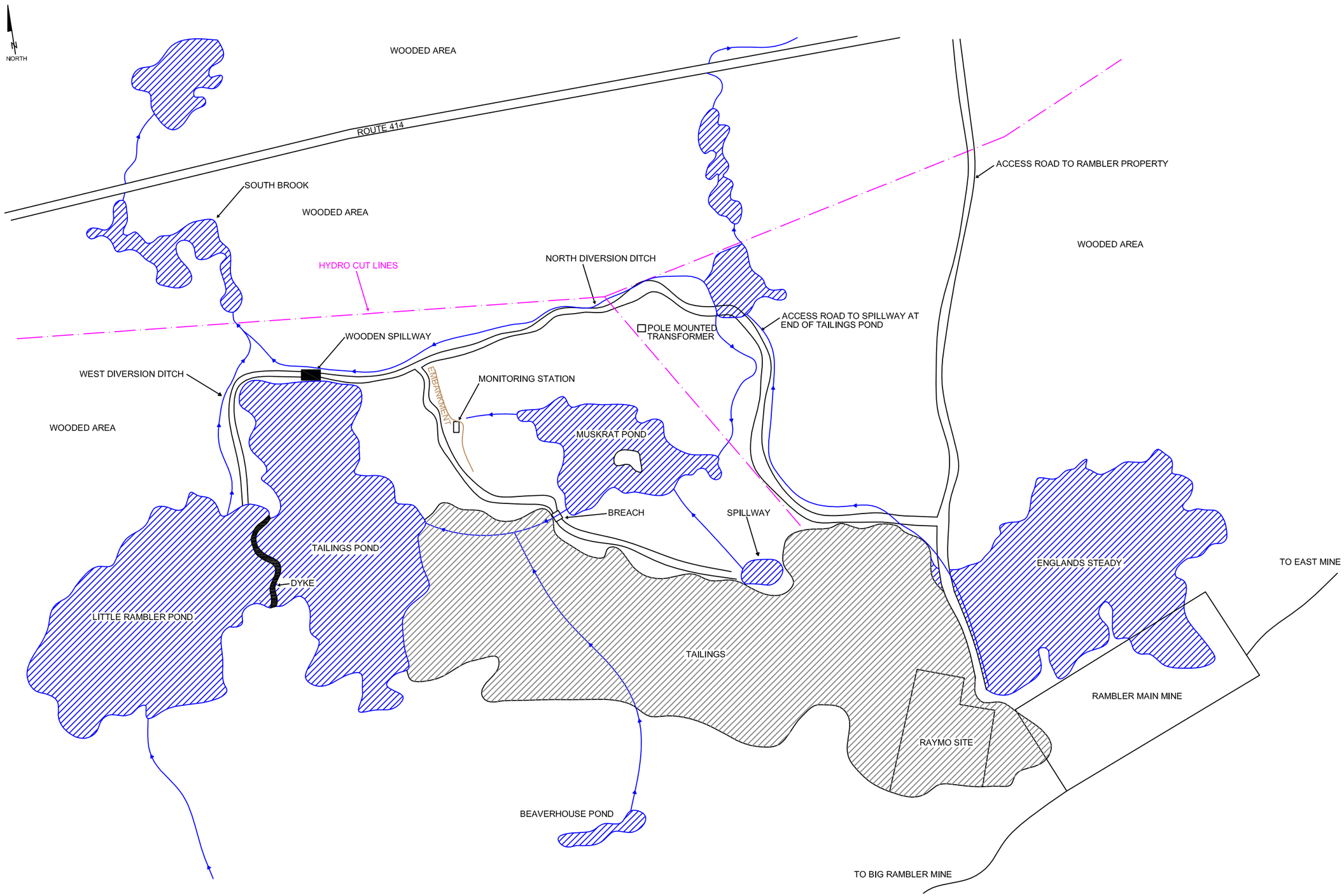
It is important to note that the value of pH (4.35) detected in surface water leaving the property (i.e. South Brook near Route 414) was well below the CCME-FAL guideline of 6.5 to 9.0. This indicates off-Site migration of acidic waters from the Site into the aquatic environmental of South Brook and possibility other downgradient freshwater and marine habitats.

Tailings

Values of pH detected in all four tailings samples analyzed were less than the applicable CCME-CEQG of 6.0 to 8.0. Values of pH detected in the tailings samples analyzed ranged from 2.2 (TAIL-TL3) to 2.5 (TAIL-TL1). The ABA analyses also indicated that the tailings present at the Site are PAG. The majority of the tailings present at the Site was not buried or covered with water, but exposed the elements, air and water. Given these condition, tailings present at the Site will likely continue to produce acid and therefore have an impact on the surrounding and downgradient (off-Site) aquatic environments.

APPENDIX A-5

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS

STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

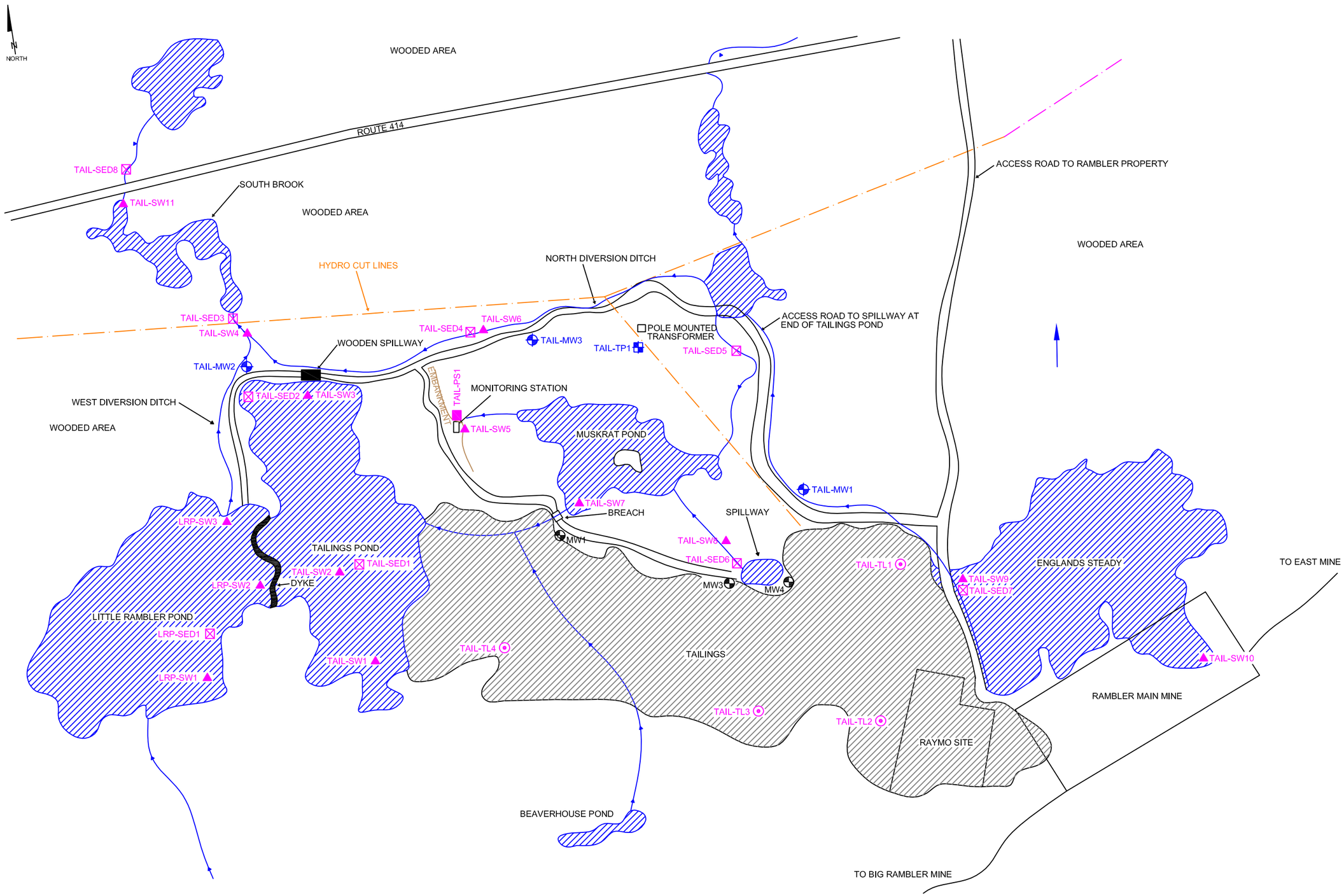
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

TAILINGS AREA

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
5.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- JWEL STAND PIPE LOCATION
- SURFACE WATER SAMPLE
- TAILINGS SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- SEDIMENT SAMPLE LOCATION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

TAILINGS AREA SAMPLE LOCATIONS

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
5.2	January 2007	

APPENDIX B-5

PHOTOGRAPHIC RECORD

Photo 1: Overview of the Tailings Area.
(Looking Northwest)

Photo 2: Overview of the Tailings Area.
(Looking West)

Photo 3: Wooden Spillway of Tailings Holding Pond.

Photo 4: South Brook.
(Note Iron-Stained Rocks)

Photo 5: North Diversion Ditch.
(Note Iron-Stained Rocks).

Photo 6: Collapsed Section of the Dyke/Bern between Muskrat Pond and the Tailings (i.e. Breach).

Photo 7: Water Flowing from Muskrat Pond through the Tailings.

Photo 8: Monitoring Station.

Photo 9: Spillway – No Discharge Flow.

Photo 10: Pole-Mounted Transformer Along Hydro Cut-Lines.

Photo 11: Typical Standpipe.
(MW1)

APPENDIX C-5

MONITOR WELL AND TEST PIT LOGS

LOG OF MONITORING WELL TAIL-MW1

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 6, 2006** DATE COMPLETED: **September 6, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
	0			STICK-UP: 0.90 (m)AGS						
			FILL - Dark brown, sand and gravel with some fines, organics, wood debris, cobbles and boulders, moist to saturatd, compact. No hydrocarbon odour.	DATE INSTALLED: September 6, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	55	18		UTM NAD27 East Coordinate: 565490 North Coordinate: 5527462
	1				2	SS	33	18		
					3	SS	52	>50		
	2		BOULDERS and COBBLES - Grey, some sand and gravel, saturated, compact to dense. No hydrocarbon odour.	WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 6/06 2.88	4	CORE		N/A		
	3									

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

LOG OF MONITORING WELL TAIL-MW2

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 7, 2006** DATE COMPLETED: **September 7, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
			PEAT - Dark brown, bog material / organics, some sand and gravel, moist, loose. No hydrocarbon odour.	STICK-UP: 0.94 (m)AGS DATE INSTALLED: September 7, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	25	3	14.4	UTM NAD27 East Coordinate: 564057 North Coordinate: 5527811
	1		FILL - Dark brown to grey, sand and gravel with some fines, some organics, cobbles and boulders, moist to saturated, loose to compact. No hydrocarbon odour.		2	SS	30	6	21.7	
					3	SS	40	41	28.1	
	2		BEDROCK - Grey, highly fractured.	WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 7/06 2.74	4	CORE	83	21		
	3									

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

LOG OF MONITORING WELL TAIL-MW3

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 7, 2006** DATE COMPLETED: **September 7, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
				STICK-UP: 0.90 (m)AGS						
			FILL - Dark brown, sand and gravel with some fines, some organics, moist, loose. No hydrocarbon odour.	DATE INSTALLED: September 7, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	45	3	35.9	UTM NAD27 East Coordinate: 564747 North Coordinate: 5527865
	1		POSSIBLE GLACIAL TILL - Grey, sand and gravel with fines, cobbles and boulders, moist to saturated, compact. No hydrocarbon odour.		2	SS	25	18	12.9	
					3	SS	42	66	29.2	
	2		BEDROCK - Grey, fractured.	WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 7/06 2.70	4	CORE	100	83		

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

Department of Natural Resources
Phase II Environmental Site Assessment
Tailings Area

Test Pit Identification Number	Depth From – To (m)	Soil Description
TAIL-TP1	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some cobbles, dry, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand underneath pole-mounted transformer.

APPENDIX D-5

FIELD PH, TEMPERATURE AND CONDUCTANCE DATA

Field Temperature, pH and Conductance Groundwater Data - Tailings Area

MW Location	TAIL- MW1			TAIL - MW2			TAIL- MW3		
Date	12-Sep-06			12-Sep-06			12-Sep-06		
Cumulative Volume Purged (L)	5.0	10.0	15.0	5.0	10.0	15.0	5.0	10.0	15.0
Field pH	4.62	4.66	4.75	5.98	6.04	6.18	6.05	6.25	6.32
Field Temp (Degrees C)	12.2	11.2	10.9	16.4	14.1	13.4	12.3	11.9	11.6
Field Conductance (uS/cm)	437	434	437	2710	2720	2720	281	315	293

MW Location	MW1			MW3			MW4		
Date	12-Sep-06			12-Sep-06			12-Sep-06		
Cumulative Volume Purged (L)	5.0	10.0	15.0	5.0	10.0	15.0	5.0	10.0	15.0
Field pH	6.80	7.05	7.32	2.61	2.77	2.77	3.71	4.07	4.35
Field Temp (Degrees C)	14.3	13.9	13.9	13.1	12.7	12.6	11.6	11.5	11.4
Field Conductance (uS/cm)	363	365	365	1542	1548	1588	1458	1459	1487

APPENDIX E-5

GPS COORDINATES

GPS COORDINATES - NAD27 - TAILINGS AREA

Location	Northing	Easting
TAIL-PS1	564467	5527813
TAIL-TP1	564445	5527806
TAIL-SED1	564325	5527405
TAIL-SED2	564130	5527788
TAIL-SED3	564036	5527881
TAIL-SED4	564493	5527810
TAIL-SED5	565126	5527922
TAIL-SED6	565123	5527368
TAIL-SED7	565628	5527234
TAIL-SED8	563805	5528227
LRP-SED1	564120	5527274
TAIL-SW1	564371	5527488
TAIL-SW2	564325	5527405
TAIL-SW3	564130	5527788
TAIL-SW4	564030	5527880
TAIL-SW5	564467	5527813
TAIL-SW6	564493	5527810
TAIL-SW7	564445	5527806
TAIL-SW8	565123	5527368
TAIL-SW9	565628	5527234
TAIL-SW10	565911	5527307
TAIL-SW11	569804	5528191
LRP-SW1	546120	5527274
LRP-SW2	564129	5527268
LRP-SW3	564090	5527444
TAIL-MW1	565490	5527462
TAIL-MW2	564057	5527811
TAIL-MW3	564747	5527865
MW1	564445	5527806
MW3	565132	5527306
MW4	565258	5527306
TAIL-TL1	565553	5527307
TAIL-TL2	565396	5527099
TAIL-TL3	565150	5527112
TAIL-TL4	564962	5527179

APPENDIX F-5

LABORATORY ANALYSES TABLES

Table 5-1. Lead in Paint - Tailings Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-10989	TAIL-PS1	Monitoring Station	Wood	Green	5	13.2

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 5-2. Mercury in Paint - Tailings Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-10989	TAIL-PS1	Monitoring Station	Wood	Green	0.01	0.021

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 5-3: PCBs in Soil - Tailings Area

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.3	
LAB ID			S2006-10919	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	TAIL-TP1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			12-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites

Table 5-4: Metals Plus Hydrides in Groundwater - Tailings Area

		DATA				GUIDELINES
LAB ID REPORT ID DATE		Lab Blank	S2006-10858 Tail-MW1 12-Sep-06	S2006-10870 DUP E 12-Sep-06	S2006-10859 Tail-MW2 12-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**2.57**	**6.20**	**0.067**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	<0.001	0.004	**0.005**
Barium	0.001	<0.0005	0.019	0.036	0.068	**-**
Beryllium	0.001	<0.0001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.000399**	**0.008809**	**0.000093**	**0.000017**
Calcium	0.5	<0.5	484	68.2	297	**-**
Chromium	0.001	<0.001	**0.003**	**0.002**	**0.002**	**0.001**
Cobalt	0.001	<0.001	0.158	0.157	0.056	**-**
Copper	0.001	<0.001	0.001	**1.14**	<0.001	**0.002-0.004**
Iron	0.01	<0.001	**3.68**	**3.04**	**40.5**	**0.3**
Lead	0.002	<0.002	**0.017**	<0.002	**0.006**	**0.001-0.007**
Magnesium	0.02	<0.02	89.3	14.3	52.9	**-**
Manganese	0.001	<0.001	39.9	10.9	55.9	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001 (<0.0001)	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	**0.088**	**0.082**	0.014	**0.025-0.15**
Phosphorus	0.02	<0.002	0.30	0.02	0.07	**-**
Potassium	0.02	<0.02	16.3	2.06	40.5	**-**
Selenium	0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	**0.0015**	**0.0005**	**0.0021**	**0.0001**
Sodium	0.5	<0.5	24.3	5.2	15.0	**-**
Vanadium	0.005	<0.002	0.008	<0.005	0.012	**-**
Zinc	0.005	<0.001	**12.1**	**1.96**	**0.186**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria
DUP E is a blind field duplicate of groundwater sample TAIL-MW1

Table 5-5: Metals Plus Hydrides in Groundwater - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10860	S2006-10861	S2006-10862	S2006-10863	CCME-CEQGs
REPORT ID		Tail-MW3	MW1	MW3	MW4	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	**2.28**	**0.011**	**21.0**	**0.173**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	<0.001	**0.006**	**0.005**
Barium	0.001	0.040	0.039	0.004	0.018	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	**0.000141**	**0.000061**	**0.011698**	**0.002174**	**0.000017**
Calcium	0.5	51.4	95.5	173	214	**-**
Chromium	0.001	**0.030**	<0.001	**0.049**	**0.002**	**0.001**
Cobalt	0.001	0.006	0.001	0.216	0.080	**-**
Copper	0.001	**0.055**	**0.004**	**2.36**	**0.021**	**0.002-0.004**
Iron	0.01	**4.17**	**1.19**	**113**	**230**	**0.3**
Lead	0.002	<0.002	<0.002	**0.025**	**0.011**	**0.001-0.007**
Magnesium	0.02	6.30	5.69	64.5	31.2	**-**
Manganese	0.001	1.18	1.64	13.2	12.6	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	0.005	<0.002	<0.002	<0.002	**-**
Nickel	0.001	0.015	<0.001	**0.152**	**0.033**	**0.025-0.15**
Phosphorus	0.02	0.04	<0.02	0.18	0.22	**-**
Potassium	0.02	4.30	3.64	5.86	23.3	**-**
Selenium	0.001	0.001	0.001	**0.005**	**0.003**	**0.001**
Silver	0.0001	<0.0001	<0.0001	**0.0007**	**0.0006**	**0.0001**
Sodium	0.5	18.3	10.1	12.6	53.9	**-**
Vanadium	0.005	0.009	<0.005	0.020	<0.005	**-**
Zinc	0.005	0.018	<0.005	**4.37**	**0.976**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 5-6: Cyanide in Groundwater - Tailings Area

		DATA				GUIDELINES
Lab ID			S2006-10858	S2006-10870	S2006-10859	CCME-CEQGs
FIELD ID		Lab Blank	TAIL-MW1	DUP E	TAIL-MW2	(REVISED 2005)
DATE			12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	0.001	0.001	0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
DUP E is a blind field duplicate of groundwater sample TAIL-MW1

Table 5-7: Cyanide in Groundwater - Tailings Area

		DATA				GUIDELINES
Lab ID		S2006-10860	S2006-10861	S2006-10862	S2006-10863	CCME-CEQGs
FIELD ID		TAIL-MW3	MW1	MW3	MW4	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	0.001	**0.018**	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-8: General Water Chemistry in Groundwater - Tailings Area

		DATA				GUIDELINES
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10858 TAIL-MW1 12-Sep-06	S2006-10870 DUP E 12-Sep-06	S2006-10859 TAIL-MW2 12-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	Units					
Ammonia	(mg/L)	<0.01	0.75	0.73	1.70	-
Chloride	(mg/L)	<0.1	6.0	6.2	6.8	-
Conductivity	(µS/cm)	<5	570	618	1420 (1400)	-
Fluoride	(mg/L)	<0.1	**0.2**	**0.2**	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	220	229	960	-
Nitrate as N	(mg/L)	<0.05	0.16	0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	<0.015	**0.06**
pH		7.86	**4.06**	**3.67**	**5.77 (5.78)**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001	<0.001	<0.001	**0.004**
Sulphate	(mg/L)	<0.1	350	348	1200	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	63 (65)	-
Total Dissolved Solids	(mg/L)	<10	487	513	1650	-
Total Suspended Solids	(mg/L)	<2	1820	247	5170	-
Cation Balance	(meq)	-	4.79	5.08	20.9	-
Anion Balance	(meq)	-	7.47	7.42	26.4	-
Ion Balance	(%)	-	-21.9	-18.8	-11.7	-
Calcium	(mg/L)	<0.5	64.0	68.2	297	-
Magnesium	(mg/L)	<0.02	14.6	14.3	52.9	-
Potassium	(mg/L)	<0.02	2.39	2.06	40.5	-
Sodium	(mg/L)	<0.5	5.66	5.2	15.0	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designatior
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
(#) Data in brackets indicates replicate result
DUP E is a blind field duplicate of groundwater sample TAIL-MW1

Table 5-9: General Water Chemistry in Groundwater - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10860	S2006-10861	S2006-10862	S2006-10863	CCME-CEQGs
FIELD ID		TAIL-MW3	MW1	MW3	MW4	(REVISED 2005)
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	Units					
Ammonia	(mg/L)	0.27	0.31	0.87	6.12	-
Chloride	(mg/L)	6.2	6.8 (6.9)	7.1	8.8	-
Conductivity	(µS/cm)	309	465	1760	1490	-
Fluoride	(mg/L)	<0.1	<0.1 (<0.1)	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	154	262	698	663	-
Nitrate as N	(mg/L)	<0.05	0.10 (0.10)	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	**0.079**	<0.015 (<0.015)	<0.015	<0.015	**0.06**
pH		6.73	6.91	**2.75**	**4.65**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001	0.001	<0.001	**0.004**
Sulphate	(mg/L)	68.9	109 (109)	1160	1030	-
Total Alkalinity (CaCO3)	(mg/L)	124	173	<5	5	-
Total Dissolved Solids	(mg/L)	282	342	2030	1670	-
Total Suspended Solids	(mg/L)	5870	63	363	316	-
Cation Balance	(meq)	3.99	5.77	16.4	16.2	-
Anion Balance	(meq)	4.09	5.93	24.3	21.8	-
Ion Balance	(%)	-1.21	-1.33	-19.4	-14.6	-
Calcium	(mg/L)	51.4	95.5	173	214	-
Magnesium	(mg/L)	6.30	5.69	64.5	31.2	-
Potassium	(mg/L)	4.30	3.64	5.86	23.3	-
Sodium	(mg/L)	18.3	10.1	12.6	53.9	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
(#) Data in brackets indicates replicate result

Table 5-10. Metals Plus Hydrides in Freshwater Sediment - Tailings Area

			DATA			GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10908 TAIL-SED1 12-Sep-06	S2006-10909 TAIL-SED2 12-Sep-06	S2006-10910 TAIL-SED3 12-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	13400	28300	25400	-	-
Antimony	0.5	<0.5	4.0	2.3	1.6	-	-
Arsenic	0.5	<0.5	**706**	**434**	2.2	**5.9**	**17**
Barium	0.5	<0.5	1.8	4.0	23.9	-	-
Beryllium	0.2	<0.2	<0.2	0.2	<0.2	-	-
Bismuth	0.2	<0.2	5.7	2.9	<0.2	-	-
Cadmium	0.5	<0.5	**14.2**	**22.6**	<0.5	**0.6**	**3.5**
Calcium	25	<25	7220	4910	9480	-	-
Chromium	1	<1	32	**112**	**204**	**37.3**	**90**
Cobalt	1	<1	121	195	37	-	-
Copper	1	<1	**2520**	**2300**	**57**	**37.5**	**197**
Iron	5	<5	167000	51200	37800	-	-
Lead	5	<5	**152**	**191**	8	**35**	**91.3**
Magnesium	10	<10	9940	18400	21900	-	-
Manganese	1	<1	203	386	1580	-	-
Mercury	0.01	<0.01	**4.20**	**1.88**	0.07	**0.17**	**0.486**
Molybdenum	2	<2	19	8	<2	-	-
Nickel	5	<5	30	62	65	-	-
Phosphorus	5	<5	352	250	181	-	-
Potassium	10	<10	1960	1630	585	-	-
Selenium	0.1	<0.1	6.3	16.7	<0.1	-	-
Silver	0.25	<0.25	2.86	2.24	<0.25	-	-
Sodium	25	<25	420	473	430	-	-
Vanadium	5	<5	64	28	67	-	-
Zinc	2	<2	**1700**	**5540**	48	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 5-11. Metals Plus Hydrides in Freshwater Sediment - Tailings Area

		DATA				GUIDELINES	
LAB ID		S2006-10911	S2006-10912	S2006-10913	S2006-10914	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID		TAIL-SED4	TAIL-SED5	TAIL-SED6	TAIL-SED7		
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	23300	33400	25500	4980	-	-
Antimony	0.5	1.5	3.5	2.9	3.8	-	-
Arsenic	0.5	1.4	**47.8**	**14.8**	**219**	**5.9**	**17**
Barium	0.5	12.0	25.6	8.2	5.1	-	-
Beryllium	0.2	<0.2	0.3	<0.2	<0.2	-	-
Bismuth	0.2	0.2	1.8	1.5	3.7	-	-
Cadmium	0.5	<0.5	**7.1**	**0.7**	**1.3**	**0.6**	**3.5**
Calcium	25	7160	3400	8920	2370	-	-
Chromium	1	**187**	**178**	**78**	12	**37.3**	**90**
Cobalt	1	19	193	41	96	-	-
Copper	1	**117**	**2380**	**1350**	**3560**	**37.5**	**197**
Iron	5	32500	115000	84500	123000	-	-
Lead	5	9	**100**	**60**	**66**	**35**	**91.3**
Magnesium	10	18900	19900	18900	2380	-	-
Manganese	1	429	886	471	69	-	-
Mercury	0.01	0.06	**0.28**	**0.49**	**1.55**	**0.17**	**0.486**
Molybdenum	2	<2	8	2	13	-	-
Nickel	5	56	112	66	21	-	-
Phosphorus	5	78	606	125	227	-	-
Potassium	10	392	502	549	779	-	-
Selenium	0.1	<0.1	0.2	<0.1	21.7	-	-
Silver	0.25	<0.25	0.86	4.44	1.55	-	-
Sodium	25	293	235	301	215	-	-
Vanadium	5	13	101	33	23	-	-
Zinc	2	75	**2330**	**389**	87	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 5-12. Metals Plus Hydrides in Freshwater Sediment - Tailings Area

		DATA			GUIDELINES	
LAB ID		S2006-10916	S2006-10915	S2006-10918	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID		DUP A	TAIL-SED8	LRP-SED1		
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	2100	19200	17000	-	-
Antimony	0.5	3.1	1.3	2.7	-	-
Arsenic	0.5	**233**	**7.6**	**66.0**	**5.9**	**17**
Barium	0.5	6.8	23.7	14.7	-	-
Beryllium	0.2	<0.2	<0.2	<0.2	-	-
Bismuth	0.2	3.2	0.2	0.4	-	-
Cadmium	0.5	**1.4**	<0.5	**0.9**	**0.6**	**3.5**
Calcium	25	1590	9120	3630	-	-
Chromium	1	8	**118**	**170**	**37.3**	**90**
Cobalt	1	56	24	16	-	-
Copper	1	**3070**	**150**	**1090**	**37.5**	**197**
Iron	5	91900	41300	34400	-	-
Lead	5	**62**	28	**63**	**35**	**91.3**
Magnesium	10	1190	15100	15500	-	-
Manganese	1	35	697	232	-	-
Mercury	0.01	**0.22**	0.08	**0.30**	**0.17**	**0.486**
Molybdenum	2	14	<2	3	-	-
Nickel	5	15	48	49	-	-
Phosphorus	5	189	214	157	-	-
Potassium	10	737	652	274	-	-
Selenium	0.1	21.6	<0.1	0.9	-	-
Silver	0.25	0.89	<0.25	0.61	-	-
Sodium	25	133	412	255	-	-
Vanadium	5	12	59	54	-	-
Zinc	2	121	107	**195**	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)
DUP A is a blind field duplicate of sediment sample Tail-SED7

Table 5-13. Cyanide and pH in Freshwater Sediment - Tailings Area

		DATA				GUIDELINES	
LAB ID			S2006-10908	S2006-10909	S2006-10910	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID		Lab Blank	TAIL-SED1	TAIL-SED2	TAIL-SED3		
DATE (D/M/Y)			12-Sep-06	12-Sep-06	12-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	5	<0.001	0.193	0.266	0.086	-	-
pH	-	6.3	6.5	4.8	5.4	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
(#) Data in brackets indicates replicate result

Table 5-14. Cyanide and pH in Freshwater Sediment - Tailings Area

		DATA				GUIDELINES	
LAB ID		S2006-10911	S2006-10912	S2006-10913	S2006-10914	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID		TAIL-SED4	TAIL-SED5	TAIL-SED6	TAIL-SED7		
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	5	0.061	0.505	11.4	0.086	-	-
pH	-	4.6 (4.6)	5.1	5.8	5.9 (5.9)	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
(#) Data in brackets indicates replicate result

Table 5-15. Cyanide and pH in Freshwater Sediment - Tailings Area

		DATA			GUIDELINES	
LAB ID		S2006-10916	S2006-10915	S2006-10918	1999 CCME RECOMMENDED	
FIELD ID		DUP A	TAIL-SED8	LRP-SED1	SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	5	-	0.052	0.042	-	-
pH	-	5.1	4.3	4.2	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
(#) Data in brackets indicates replicate result
DUP A is a blind field duplicate of sediment sample Tail-SED7

Table 5-16: Metals Plus Hydrides in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID REPORT ID DATE		Lab Blank	S2006-10840 Tail-SW1 12-Sep-06	S2006-10841 Tail-SW2 12-Sep-06	S2006-10842 Tail-SW3 12-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**3.68**	**4.51**	**3.97**	**0.005-0.1**
Antimony	0.001	<0.001	0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	**0.050**	0.003	**0.011**	**0.005**
Barium	0.001	<0.0005	0.007	0.009	0.008	**-**
Beryllium	0.001	<0.0001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.010418**	**0.012977**	**0.011488**	**0.000017**
Calcium	0.5	<0.5	55.8	54.9	55.6	**-**
Chromium	0.001	<0.001	**0.009**	**0.011**	**0.010**	**0.001**
Cobalt	0.001	<0.001	0.075	0.089	0.080	**-**
Copper	0.001	<0.001	**1.11**	**1.11**	**1.11**	**0.002-0.004**
Iron	0.01	<0.001	**63.4**	**61.2**	**61.2**	**0.3**
Lead	0.002	<0.002	**0.073**	**0.089**	**0.081**	**0.001-0.007**
Magnesium	0.02	<0.02	32.5	31.4	31.7	**-**
Manganese	0.001	<0.001	2.42	2.40	2.42	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	**0.027**	**0.033**	**0.029**	**0.025-0.15**
Phosphorus	0.02	<0.002	0.06	0.08	0.07	**-**
Potassium	0.02	<0.02	4.98	4.80	4.83	**-**
Selenium	0.001	<0.001	0.001	<0.001	0.001	**0.001**
Silver	0.0001	<0.0001	0.0001	**0.0002**	0.0001	**0.0001**
Sodium	0.5	<0.5	4.8	4.6	4.7	**-**
Vanadium	0.005	<0.002	<0.005	<0.005	<0.005	**-**
Zinc	0.005	<0.001	**5.19**	**5.13**	**5.18**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 5-17: Metals Plus Hydrides in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10843	S2006-10844	S2006-10845	S2006-10846	CCME-CEQGs
REPORT ID		Tail-SW4	Tail-SW5	Tail-SW6	Tail-SW7	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	**0.280**	**0.139**	**0.446**	**0.888**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	0.003	**0.007**	**0.005**
Barium	0.001	0.006	0.009	0.004	0.014	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	**0.000020**	**0.000171**	**0.000668**	**0.000753**	**0.000017**
Calcium	0.5	1.9	5.6	12.2	25.9	**-**
Chromium	0.001	0.001	**0.002**	<0.001	0.001	**0.001**
Cobalt	0.001	<0.001	0.007	0.013	0.028	**-**
Copper	0.001	**0.003**	**0.024**	**0.211**	**0.172**	**0.002-0.004**
Iron	0.01	**0.69**	**1.82**	**4.94**	**1.23**	**0.3**
Lead	0.002	<0.002	<0.002	<0.002	**0.006**	**0.001-0.007**
Magnesium	0.02	0.75	2.43	3.99	7.04	**-**
Manganese	0.001	0.021	0.690	0.416	1.54	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	0.001	0.003	0.005	0.009	**0.025-0.15**
Phosphorus	0.02	<0.02	0.06	<0.02	<0.02	**-**
Potassium	0.02	0.23	2.20	0.74	0.98	**-**
Selenium	0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	**0.0002**	<0.0001	<0.0001	0.0001	**0.0001**
Sodium	0.5	2.7	4.9	5.3	4.5	**-**
Vanadium	0.005	<0.005	<0.005	<0.005	<0.005	**-**
Zinc	0.005	0.006	**0.044**	**0.280**	**0.269**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 5-18: Metals Plus Hydrides in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10847	S2006-10848	S2006-10851	S2006-10849	CCME-CEQGs
REPORT ID		Tail-SW8	Tail-SW9	Dup D	Tail-SW10	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	**12.3**	**0.605**	**0.579**	**1.40**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	0.002	<0.001	<0.001	**0.007**	**0.005**
Barium	0.001	0.014	0.005	0.005	0.005	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	**0.003613**	**0.000880**	**0.000864**	**0.002107**	**0.000017**
Calcium	0.5	66.3	10.5	10.2	11.3	**-**
Chromium	0.001	**0.016**	0.001	0.001	0.001	**0.001**
Cobalt	0.001	0.095	0.014	0.014	0.019	**-**
Copper	0.001	**0.823**	**0.275**	**0.255**	**0.959**	**0.002-0.004**
Iron	0.01	**11.8**	**4.35**	**3.98**	**4.85**	**0.3**
Lead	0.002	**0.013**	<0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	33.1	3.11	3.00	3.49	**-**
Manganese	0.001	3.27	0.401	0.390	0.665	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	**0.072**	0.006	0.006	0.009	**0.025-0.15**
Phosphorus	0.02	0.03	<0.02	<0.02	0.02	**-**
Potassium	0.02	2.32	0.57	0.57	0.59	**-**
Selenium	0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Sodium	0.5	8.8	4.7	4.7	4.9	**-**
Vanadium	0.005	<0.005	<0.005	<0.005	<0.005	**-**
Zinc	0.005	**1.85**	**0.357**	**0.364**	**0.675**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 5-19: Metals Plus Hydrides in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10850	S2006-10864	S2006-10865	S2006-10866	CCME-CEQGs
REPORT ID		Tail-SW11	LRP-SW1	LRP-SW2	LRP-SW3	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	**0.448**	**0.282**	**0.288**	**0.299**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	0.004	0.003	<0.001	<0.001	**0.005**
Barium	0.001	0.006	0.006	0.006	0.006	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	**0.000343**	**0.000032**	**0.000022**	**0.000064**	**0.000017**
Calcium	0.5	5.8	2.0	1.6	1.6	**-**
Chromium	0.001	0.001	0.001	0.001	0.001	**0.001**
Cobalt	0.001	0.006	<0.001	<0.001	<0.001	**-**
Copper	0.001	**0.100**	**0.003**	**0.003**	**0.003**	**0.002-0.004**
Iron	0.01	**2.42**	**0.660**	**0.62**	**0.62**	**0.3**
Lead	0.002	<0.002	<0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	2.00	0.73	0.68	0.67	**-**
Manganese	0.001	0.208	0.022	0.019	0.019	**-**
Mercury	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	0.003	0.001	0.001	0.001	**0.025-0.15**
Phosphorus	0.02	<0.02	0.02	<0.02	<0.02	**-**
Potassium	0.02	0.43	0.25	0.21	0.21	**-**
Selenium	0.001	<0.001	<0.001	<0.001	0.001	**0.001**
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Sodium	0.5	3.7	2.5	2.4	2.4	**-**
Vanadium	0.005	<0.005	<0.005	<0.005	<0.005	**-**
Zinc	0.005	**0.139**	<0.005	<0.005	<0.005	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 5-20. Cyanide in Surface Water - Tailings Area

		DATA				GUIDELINES
Lab ID			S2006-10840	S2006-10841	S2006-10842	CCME-CEQGs
FIELD ID		Lab Blank	Tail-SW1	Tail-SW2	Tail-SW3	(REVISED 2005)
DATE			12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-21. Cyanide in Surface Water - Tailings Area

		DATA				GUIDELINES
Lab ID		S2006-10843	S2006-10844	S2006-10845	S2006-10846	CCME-CEQGs
FIELD ID		Tail-SW4	Tail-SW5	Tail-SW6	Tail-SW7	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-22. Cyanide in Surface Water - Tailings Area

		DATA				GUIDELINES
Lab ID		S2006-10847	S2006-10848	S2006-10851	S2006-10849	CCME-CEQGs
FIELD ID		Tail-SW8	Tail-SW9	Dup D	Tail-SW10	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
Dup D is a blind field duplicate of surface warer sample Tail-SW9

Table 5-23. Cyanide in Surface Water - Tailings Area

		DATA				GUIDELINES
Lab ID		S2006-10850	S2006-10864	S2006-10865	S2006-10866	CCME-CEQGs
FIELD ID		Tail-SW11	LRP-SW1	LRP-SW2	LRP-SW3	(REVISED 2005)
DATE		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-24: General Water Chemistry in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10840 Tail-SW1 12-Sep-06	S2006-10841 Tail-SW2 12-Sep-06	S2006-10842 Tail-SW3 12-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	Units					
Ammonia	(mg/L)	<0.01	0.03	0.03	0.02	-
Chloride	(mg/L)	<0.1	4.2	4.2	4.1	-
Conductivity	(µS/cm)	<5	1230	1250	1250	-
Fluoride	(mg/L)	<0.1	<0.1	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	273	266	269	-
Nitrate as N	(mg/L)	<0.05	0.05	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	<0.015	**0.06**
pH		7.86	**2.55**	**2.55**	**2.54**	**6.5-9**
Phenols	(mg/L)	<0.001	0.002	0.002	0.002	**0.004**
Sulphate	(mg/L)	<0.1	604	564	567	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	<5	-
Total Dissolved Solids	(mg/L)	<10	910	866	880	-
Total Suspended Solids	(mg/L)	<2	6	2	5	-
Cation Balance	(meq)	-	8.61	8.46	8.59	-
Anion Balance	(meq)	-	12.7	11.87	11.9	-
Ion Balance	(%)	-	-19.2	-16.8	-16.3	-
Calcium	(mg/L)	<0.5	55.8	54.9	55.6	-
Magnesium	(mg/L)	<0.02	32.5	31.4	31.7	-
Potassium	(mg/L)	<0.02	4.98	4.80	4.83	-
Sodium	(mg/L)	<0.5	4.8	4.6	4.7	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
(#) Data in brackets indicates replicate result
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-25: General Water Chemistry in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10843	S2006-10844	S2006-10845	S2006-10846	CCME-CEQGs
FIELD ID		Tail-SW4	Tail-SW5	Tail-SW6	Tail-SW7	(REVISED 2005)
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	Units					
Ammonia	(mg/L)	0.04	0.02	0.08	0.60	-
Chloride	(mg/L)	2.9	5.2	5.5	4.2	-
Conductivity	(µS/cm)	25	78	156	337	-
Fluoride	(mg/L)	<0.1	<0.1	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	7.7	24.1	46.9	93.7	-
Nitrate as N	(mg/L)	0.05	<0.05	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	<0.015	**0.06**
pH		**5.56**	**4.89**	**4.08**	**3.23**	**6.5-9**
Phenols	(mg/L)	<0.001	**0.009**	<0.001	<0.001	**0.004**
Sulphate	(mg/L)	0.5	24.1	61.8	125	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	<5	-
Total Dissolved Solids	(mg/L)	21	70	107	180	-
Total Suspended Solids	(mg/L)	<2	18	4	3	-
Cation Balance	(meq)	0.28	0.75	1.27	2.68	-
Anion Balance	(meq)	0.18	0.70	1.44	2.72	-
Ion Balance	(%)	19.8	3.43	-6.42	-0.75	-
Calcium	(mg/L)	1.9	5.6	12.2	25.9	-
Magnesium	(mg/L)	0.75	2.43	3.99	7.04	-
Potassium	(mg/L)	0.23	2.20	0.74	0.98	-
Sodium	(mg/L)	2.7	4.9	5.3	4.5	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
(#) Data in brackets indicates replicate result
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-26: General Water Chemistry in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10847	S2006-10848	S2006-10851	S2006-10849	CCME-CEQGs
FIELD ID		Tail-SW8	Tail-SW9	Dup D	Tail-SW10	(REVISED 2005)
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	Units					
Ammonia	(mg/L)	<0.01	0.04	0.04	0.05	-
Chloride	(mg/L)	5.1	4.9 (5.0)	5.1	5.1	-
Conductivity	(µS/cm)	1040	131	127	152	-
Fluoride	(mg/L)	**0.3**	<0.1 (<0.1)	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	301.9	39.0	37.8	42.6	-
Nitrate as N	(mg/L)	<0.05	<0.05 (<0.05)	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015 (<0.015)	<0.015	<0.015	**0.06**
pH		**2.71**	**4.27**	**4.22**	**4.22**	**6.5-9**
Phenols	(mg/L)	0.002	<0.001	<0.001	<0.001	**0.004**
Sulphate	(mg/L)	302	48.5 (49.2)	47.3	57.8	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	<5	-
Total Dissolved Solids	(mg/L)	758	98	89 (92)	99	-
Total Suspended Solids	(mg/L)	<2	5	4	6	-
Cation Balance	(meq)	8.42	1.05	1.03	1.14	-
Anion Balance	(meq)	6.44	1.15	1.13	1.35	-
Ion Balance	(%)	13.4	-4.31	-4.38	-8.38	-
Calcium	(mg/L)	66.3	10.5	10.2	11.3	-
Magnesium	(mg/L)	33.1	3.11	3.00	3.49	-
Potassium	(mg/L)	2.32	0.57	0.57	0.59	-
Sodium	(mg/L)	6.9	4.7	4.7	4.8	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
(#) Data in brackets indicates replicate result
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria
Dup D is a blind field duplicate of surface warer sample Tail-SW9

Table 5-27: General Water Chemistry in Surface Water - Tailings Area

		DATA				GUIDELINES
LAB ID		S2006-10850	S2006-10864	S2006-10865	S2006-10866	CCME-CEQGs
FIELD ID		Tail-SW11	LRP-SW1	LRP-SW2	LRP-SW3	(REVISED 2005)
DATE (D/M/Y)		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	FAL
PARAMETERS	Units					
Ammonia	(mg/L)	0.02	0.01	0.02	0.03	-
Chloride	(mg/L)	4.3	3.2	3.3	3.2	-
Conductivity	(µS/cm)	77	26	23	23	-
Fluoride	(mg/L)	<0.1	<0.1	<0.1	<0.1	**0.12**
Hardness as CaCO3	(mg/L)	22.8	7.9	6.9	6.8	-
Nitrate as N	(mg/L)	0.05	<0.05	<0.05	<0.05	**13**
Nitrite as N	(mg/L)	<0.015	<0.015	<0.015	<0.015	**0.06**
pH		**4.35**	**5.71**	**5.65**	**5.63**	**6.5-9**
Phenols	(mg/L)	<0.001	<0.001	<0.001	<0.001	**0.004**
Sulphate	(mg/L)	23.4	0.5	0.4	0.4	-
Total Alkalinity (CaCO3)	(mg/L)	<5	5	5	5	-
Total Dissolved Solids	(mg/L)	64	62	48	53	-
Total Suspended Solids	(mg/L)	2	27	4	<2	-
Cation Balance	(meq)	0.67	0.27	0.25	0.24	-
Anion Balance	(meq)	0.61	0.21	0.20	0.20	-
Ion Balance	(%)	4.62	13.9	9.92	9.59	-
Calcium	(mg/L)	5.8	2.0	1.6	1.6	-
Magnesium	(mg/L)	2.00	0.72	0.68	0.67	-
Potassium	(mg/L)	0.43	0.25	0.21	0.21	-
Sodium	(mg/L)	3.7	2.5	2.4	2.4	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
(#) Data in brackets indicates replicate result
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 5-28: Metals in Tailings - Tailings Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0 - 0.5 S2006-10904 TAIL-TL1 11-Sep-06	0 - 0.5 S2006-10905 TAIL-TL2 11-Sep-06	0 - 0.5 S2006-10906 TAIL-TL3 11-Sep-06	0 - 0.5 S2006-10907 TAIL-TL4 11-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	6680	2650	2600	6620	-
Antimony	0.5	<0.5	10.7	11.1	5.8	3.2	**40**
Arsenic	0.5	<0.5	**387**	**229**	**166**	**270**	**12**
Barium	0.5	<0.5	18.3	18.2	16.1	17.8	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	14.2	6.9	5.9	13.0	-
Cadmium	0.5	<0.5	1.7	2.5	1.5	2.6	**22**
Calcium	25	<25	3570	6030	6770	10300	-
Chromium	1	<1	27	12	13	29	**87**
Cobalt	1	<1	94	77	54	47	**300**
Copper	1	<1	**4390**	**6840**	**1440**	**614**	**91**
Iron	5	<5	270000	193000	87900	71900	-
Lead	5	<5	**263**	**1260**	**796**	**704**	**600**
Magnesium	10	<10	6120	2050	1910	6620	-
Manganese	1	<1	116	37	37	82	-
Mercury	0.01	<0.01	0.42	5.34	9.94	10.5	**50**
Molybdenum	2	<2	21	33	29	25	**40**
Nickel	5	<5	17	14	12	12	**50**
Phosphorus	5	<5	359	158	111	102	-
Potassium	10	<10	1300	1580	1590	1660	-
Selenium	0.1	<0.1	0.4	<0.1	**13.2**	**12.8**	**3.9**
Silver	0.25	<0.25	2.67	1.38	1.26	0.51	**40**
Sodium	25	<25	259	304	287	346	-
Vanadium	5	<5	40	20	19	38	**130**
Zinc	2	<2	114	**496**	218	**681**	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 5-29: Cyanide in Tailings - Tailings Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	
LAB ID		Lab	S2006-10904	S2006-10905	S2006-10906	S2006-10907	1999 CCME RECOMMENDED
FIELD ID		Blank	TAIL-TL1	TAIL-TL2	TAIL-TL3	TAIL-TL4	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	<0.001	0.016	0.017	0.012	0.012	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 5-30: pH of Tailings - Tailings Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	
LAB ID		Lab	S2006-10904	S2006-10905	S2006-10906	S2006-10907	1999 CCME RECOMMENDED
FIELD ID		Blank	TAIL-TL1	TAIL-TL2	TAIL-TL3	TAIL-TL4	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL	-	-	-	-	-	-
pH	-	6.3	**2.5 (2.5)**	**2.4**	**2.2**	**2.3**	**6.0 - 8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 5-31: Modified Acid-Base Accounting for Tailings - Tailings Area

Lab ID	Sample ID	TOC	Paste pH	Total Sulphur	Sulfate	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AR
				%	%	%	Kg $CaC0_3$/tonne			
63999-01	TAIL - TL1	0.11	2.2	23.0	1.17	21.8	682	-11.1	-693	-0.02
63999-02	TAIL - TL2	0.08	2.0	21.5	1.71	19.8	618	-11.6	-630	-0.02
64018-01	TAIL - TL3	0.09	2.0	10.4	1.28	9.1	285	-12.3	-297	-0.04
63999-03	TAIL - TL4	0.17	2.0	12.4	3.27	9.13	285	-31.2	-316	-0.11

Notes:
TOC: Total Organic Carbon
The modified acid-base accounting was determined by the modified Sobek method
Percent Sulfide is calculated by subtracting the Percent Sulfate from Total Percent Sulphur
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer

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APPENDICES

6.0 AREA E – RAMBLER MAIN MINE

6.1 SITE DESCRIPTION

The Rambler Main Mine Site is located approximately 500 m east of the Raymo Processing Facility and consists of 14 main structures: mill building, crusher building, chemistry laboratory, maintenance garage, storage shack, hoist building, storage shed, core shack, refuelling station, security shed, weigh scales, main office building, pumphouse and a storage rack (refer to Figure 6.1, Appendix A-6 and Photos 1 to 15, Appendix B-6). As outlined in the RFP, these Site buildings remain the property of Ming Minerals Limited and therefore were excluded from this investigation.

6.2 PHASE I ESA SITE INSPECTION – AMEC JUNE 2006

Since the Rambler Main Mine (Mining Lease 145) was not assessed during the previous Phase I ESA competed for the Site in March 2005, the DNRMD requested that AMEC conduct a Phase I ESA site inspection to identify any potential environmental concerns at the Site and develop a Phase II ESA sampling program for the Site.

The Phase I ESA site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). Please note that since the Site buildings are not owned by the Crown, they were excluded from this investigation. The assessment was limited to the exterior property. The following information and observations were recorded by AMEC at the time of the Phase I ESA site inspection:

- A pad-mounted transformer was observed approximately 30 m east of the security shed (refer to Figure 6.1, Appendix A-6 and Photo 16, Appendix B-6);
- A pole-mounted transformer was observed between the security shed and the pad-mounted transformer (refer to Figure 6.1, Appendix A-6 and Photo 17, Appendix B-6);
- A diesel-powered pump was observed inside the pumphouse and potential fuel lines were observed extending from the southwest corner of the structure (refer to Figure 6.1, Appendix A-6 and Photos 14, 18 and 19, Appendix B-6). No fuel source was observed in proximity to the pumphouse at the time of the site visit;
- Two areas containing several empty 45-gallon drums, currently filled with gravel and sand, were observed west and southwest of the main mine building (refer to Figure 6.1, Appendix A-6 and Photos 20 and 21, Appendix B-6);
- Two 200-gallon ASTs and a diesel-powered generator were observed on the east side of the mill building (refer to Figure 6.1, Appendix A-6 and Photos 22 and 23, Appendix B-6);
- An area of stained soil was observed on east side of the mill building, adjacent to and downgradient of the area containing the 200-gallon ASTs and diesel-powered generator (refer to Figure 6.1, Appendix A-6 and Photo 24, Appendix B-6);
- The Site representative identified a potential PCB and Reagent Storage Area located on the east side of the main mill building storage area (refer to Figure 6.1, Appendix A-6 and Photo 25,

Appendix B-6). These locations were confirmed through a review of the documentation presented in the Phase I ESA report;

- A storage shack containing five 45-gallon drums (full) of an unknown substance was observed on the southeast corner of the main mill building. A hazardous material suit and remnants of several deteriorated drums were also observed inside the storage shack, evidence of potential hazardous materials storage within the structure (refer to Figure 6.1, Appendix A-6 and Photos 6, 26 and 27, Appendix B-6);
- An empty 45-gallon drum, labelled cyanide, was observed near a partially opened door on the west side of the main mill building (refer to Figure 6.1, Appendix A-6 and Photo 28, Appendix B-6). This suggests the use and storage of cyanide at the Site, as indicated the Phase I ESA report;
- Three empty deteriorated 45-gallon drums were observed on the southwest corner of the chemical laboratory (refer to 6.1, Appendix A-6 and Photo 29, Appendix B-6). Also, a large quantify of product samples and laboratory chemicals and reagents were observed being stored within the structure;
- Fill and vents pipes of an UST were observed on the northside of the maintenance garage (refer to Figure 6.1, Appendix A-6 and Photo 30, Appendix B-6);
- An area of stained soil was observed on the northeast corner of the maintenance garage (refer to Figure 6.1, Appendix A-6 and Photo 31, Appendix B-6). A strong petroleum hydrocarbon odour was also observed at this location. Due to the presence a small hole in the aluminum siding of the maintenance garage at this location (possible fuel line hole) and the presence of a discarded 200-gallon AST at the rear of the structure, it is possible that the discarded AST was historically present at this location of the Site (refer to Figure 6.1, Appendix A-6 and Photo 32, Appendix B-6);
- The rear entrance to the basement/lower level of the maintenance garage was observed to be flooded at the time of the site inspection (refer to Figure 6.1, Appendix A-6 and Photos 31 and 33, Appendix B-6). When the water near the rear entrance to the maintenance garage was disturbed, a visible hydrocarbon sheen was observed on the water's surface (refer to Figure 6.1, Appendix A-6 and Photo 34, Appendix B-6);
- A discarded 5,000-gallon tank (possible former UST) was observed approximately 15 m south of the maintenance garage (refer to Figure 6.1, Appendix A-6 and Photo 35, Appendix B-6);
- A shallow drainage ditch was observed along the eastern edge of the property (refer to Figure 6.1, Appendix A-6). An abundance of metal and wooden debris was observed throughout the drainage ditch (refer to Photo 36, Appendix B-6);
- A former concrete AST holding cradle was observed on the north side of the hoist building (refer to Figure 6.1, Appendix A-6 and Photo 37, Appendix B-6). Potential fill and vent pipes of an UST were also observed on the southwest corner of the structure (refer to Figure 6.1, Appendix A-6 and Photo 38, Appendix B-6); and
- Two USTs (one gasoline and one diesel) were observed approximately 2 to 3 m north of the refuelling station present at the Site (refer to Figure 6.1, Appendix A-6 and Photo 39, Appendix B-6).

A review of Site plans of the property provided to AMEC by DNRMD and available aerial photographs for the Site revealed the former presence of a butler building at the Site (refer to Figure 6.1, Appendix

A-6). The butler building housed an electrical/mechanical workshop, a change room, warehouse and two offices (engineering office and general office).

6.3 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and the Phase I ESA site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

6.3.1 Scope of Work

Based on the information and observations recorded during the Phase I ESA site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Excavating two test pits (RMM-TP1 and RMM-TP2) along the perimeter of the storage shed and collecting soil samples for BTEX/TPH and metal plus hydrides analyses;
- Excavating one test pit (RMM-TP3) along the west side of the main mill building and collecting soil samples for BTEX/TPH and total cyanide analyses;
- Excavating one test pit (RMM-TP4) in the vicinity of the potential fuel lines identified along the southwest corner of the pumphouse and collecting soil samples for BTEX/TPH analyses;
- Excavating two test pits (RMM-TP5 and RMM-TP6) adjacent to the two 200-gallon ASTs and diesel-powered generator identified on the east side of the main mill building and collecting soil samples for BTEX/TPH, metal plus hydrides, PAH and total cyanide analyses. Test pit RMM-TP5 was excavated within an area of stained soil identified at the Site;
- Excavating two test pits (RMM-TP7 and RMM-TP8) adjacent to the PCB and Reagent Storage Areas identified on the east side of the main mill building and collecting soil samples for BTEX/TPH, PCB and total cyanide analyses;
- Excavating one test pit (RMM-TP9) along the east side of the storage shack and collecting soil samples for total cyanide analyses;
- Excavating five test pits (RMM-TP10 and RMM-TP12 to RMM-TP15) along the perimeter of the maintenance garage and collecting and collecting soil samples for BTEX/TPH, lead, PAH and total cyanide analyses. Test pit RMM-TP12 was excavated in the vicinity of the UST located on the north side of the building and test pit RMM-13 was excavated in the vicinity of the stain area and rear entrance located on the east side of the building (i.e. possible former location of the discarded 200-gallon AST);
- Excavating one test pit (RMM-TP11) in the vicinity of the three deteriorated 45-gallon drums observed on the southwest corner of the chemical laboratory and collecting soil samples for BTEX/TPH, lead and total cyanide analyses;
- Excavating two test pits (RMM-TP16 and RMM-TP34) adjacent to the crusher building and collecting soil samples for BTEX/TPH, metal plus hydrides and total cyanide analyses;

- Excavating two test pits (RMM-TP17 and RMM-TP20) along the perimeter of the core shack and collecting soil samples for BTEX/TPH and metal plus hydrides analyses;
- Excavating two test pits (RMM-TP18 and RMM-TP19) along the perimeter of the storage rack and collecting soil samples for BTEX/TPH and metal plus hydrides analyses;
- Excavating five test pits (RMM-TP21 to RMM-TP25) along the perimeter of the refueling station and associated diesel and gasoline USTs and collecting soil samples for BTEX/TPH and lead analyses. Test pits RMM-TP21 and RMM-TP22 were excavated adjacent to the diesel and gasoline USTs identified at the Site;
- Excavating one test pit (RMM-TP26) within the main office parking lot and collecting soil samples for BTEX/TPH and metals plus hydrides analyses;
- Excavating three test pits (RMM-TP27 to RMM-TP29) within the footprint of the former butler building and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses;
- Excavating four test pits (RMM-TP30 to RMM-TP33) along the perimeter of the hoist building and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses. Test pit RMM-TP30 was excavated long the northside of the building in the vicinity of the concrete AST holding cradle and RMM-TP32 was excavated along the southwest corner of the structure, adjacent to and downgradient the potential fill and vent pipes identified at the Site;
- Collecting four surface soil samples (RMM-TP35 to RMM-TP38) along the perimeter of the pad-mounted transformer identified at the Site for PCB analyses;
- Collecting one surface soil sample (RMM-TP39) underneath the pole-mounted transformer identified at the Site for PCB analyses;
- Installing six boreholes/monitoring wells (RMM-MW1 to RMM-MW6) at the Site and collecting groundwater samples for BTEX/TPH, general water chemistry, metal plus hydrides and total cyanide analyses;
- Collecting three freshwater sediment samples (RMM-SED1 to RMM-SED3) from the shallow drainage ditch located along the eastern edge of the Site for BTEX/TPH, metals plus hydrides, PAHs and PCB analyses;
- Recording GPS coordinates for all sample locations;
- Surveying the newly installed monitoring well using an oil/water interface probe and recording static groundwater levels and free phase petroleum hydrocarbon product levels (if present); and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 6.2, Appendix A-6.

6.3.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater elevations, groundwater flow direction and contaminant observations are discussed in this section.

6.3.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness grey and brown/reddish brown gravel and sand with some cobbles, boulders, organics and silt. A layer black mud/peat type material (i.e. bog) was detected in test pits RMM-TP1, RMM-TP2, RMM-TP19 and RMM-TP22 at depths ranging from 0.3 to 4.0 m bgs. Possible glacial till, consisting of brown sand and gravel with some cobbles, boulders and fines was detected in test pit RMM-TP21 at a depth of 1.8 to 2.5 m bgs. Thickness of the soil present at the Site ranged from 0.3 (RMM-TP9 and RMM-TP26) to at least 4.0 m bgs (RMM-TP22). Bedrock at the Site is grey and fractured. Detailed soil descriptions and sampling depths are provided in the borehole/monitoring well and test pit logs presented in Appendix C-6.

Please note that no USTs were encountered during test pitting/soil sampling at the location of the metal pipe identified at the southwest corner of the Hoist Building (refer to Photo 14, Appendix B-6). Therefore, based on the test pitting soil sampling program completed during the current investigation, it is not suspected that there are any USTs present at this location of the Site.

6.3.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of volatile organic vapours being released from the soils. PID readings ranged from 1.6 parts per million (ppm) to 169 ppm (refer to Appendix D-6). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

6.3.2.3 Groundwater Conditions

Groundwater Elevations and Flow Direction

All monitoring wells were gauged using a Heron™ oil/water interface meter to determine static groundwater levels. The groundwater level measurements indicate that the groundwater is located between 0.86 m to 4.62 m below the ground surface. Based on the topography and the groundwater elevations in monitoring wells at the Site, groundwater flow direction is estimated to be in a northerly direction, towards England's Steady.

Field pH, Temperature and Specific Conductance

During purging of monitoring wells RMM-MW1 to RMM-MW6, the pH, temperature and specific conductance of the groundwater being removed from the wells were monitored to ensure that representative samples of groundwater were collected. Field pH, temperature and specific conductance data are presented in Appendix E-6.

6.3.2.4 Contaminant Observations

Petroleum Hydrocarbon Odours

Petroleum hydrocarbon odours were observed during the excavation of test pits RMM-TP2, RMM-TP5, RMM-TP7, RMM-TP8, RMM-TP12 to RMM-TP15, RMM-TP19, RMM-TP21, RMM-TP23, RMM-TP29,

RMM-TP32 and RMM-TP33 (refer to Figure 6.2, Appendix A-6). Petroleum hydrocarbon odours were not observed in any of the remaining 24 test pits excavated at the Site.

A strong sulphur odour was observed during drilling of borehole/monitoring well RMM-MW1 and a strong hydrocarbon odour was observed during drilling of borehole/monitoring well RMM-MW6. RMM-MW1 was installed along the northwest corner of the main mill building and RMM-MW6 was installed adjacent to the refuelling station and associated diesel and gasoline USTs.

Free Phase Petroleum Hydrocarbon Product

Monitoring wells RMM-MW1 to RMM-MW6 were gauged using a Heron^{TM} oil/water interface meter to measure the thickness of free phase petroleum hydrocarbon product on the water table at the Site (if present). No free phase petroleum hydrocarbon product was detected in any of the monitoring wells present at the Site at the time of the current investigation.

No free phase petroleum hydrocarbon product was observed on the water table within any of the test pits excavated at the Site.

6.3.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix F-6.

6.3.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Rambler Main Mine property is outlined in Table 6-1 below.

Table 6-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Soil	RMM-TP1-SS2, RMM-TP2-SS2, RMM-TP3-SS2, RMM-TP4-SS1, RMM-TP5-SS1, RMM-TP6-SS1, RMM-TP7-SS2, RMM-TP10-SS1, RMM-TP11-SS2, RMM-TP12-SS1, RMM-TP13-SS2, RMM-TP14-SS1, RMM-TP15-SS1, RMM-TP16-SS1, RMM-TP17-SS3, RMM-TP18-SS2, RMM-TP19-SS1, RMM-TP20-SS4, RMM-TP21-SS3, RMM-TP22-SS1, RMM-TP23-SS3, RMM-TP24-SS3, RMM-TP25-SS1, RMM-TP26-SS1, RMM-TP27-SS1, RMM-TP28-SS2, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP31-SS1, RMM-TP32-SS1, RMM-TP33-SS1, RMM-TP34-SS1, RMM-MW6-SS3, DUP 3, DUP 6, DUP 7	BTEX/TPH
	RMM-TP1-SS2, RMM-TP16-SS1, RMM-TP17-SS3, RMM-TP19-SS1, RMM-TP26-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP32-SS1, DUP 12	Metals Plus Hydrides

Media	Sample ID	Analyses
Soil	RMM-TP5-SS1, RMM-TP11-SS2, RMM-TP14-SS1, RMM-TP15-SS1, RMM-TP21-SS3, RMM-TP23-SS3, RMM-TP24-SS3	Lead
	RMM-TP5-SS1, RMM-TP14-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP32-SS1, DUP 5	PAHs
	RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP35-SS1, RMM-TP36-SS1, RMM-TP37-SS1, RMM-TP38-SS1, RMM-TP39-SS1	PCBs
	RMM-TP3-SS2, RMM-TP5-SS1, RMM-TP6-SS1, RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP9-SS1, RMM-TP11-SS2, RMM-TP13-SS2, RMM-TP16-SS1, RMM-TP18-SS2, DUP 4, DUP 11	Total Cyanide
Groundwater	RMM-MW1, RMM-MW2, RMM-MW3, RMM-MW4, RMM-MW5, RMM-MW6	BTEX/TPH, Metals Plus Hydrides, Total Cyanide and General Water Chemistry
Sediment	RMM-SED-1, RMM-SED-2, RMM-SED-3	BTEX/TPH, Metals Plus Hydrides, PAHs and PCBs

Notes:
DUP 3 is a blind field duplicate of soil sample RMM-TP2-SS2 for BTEX/TPH analysis
DUP 4 is a blind field duplicate of soil sample RMM-TP9-SS1 for total cyanide analysis
DUP 5 is a blind field duplicate of soil sample RMM-TP5-SS1 for PAH analysis
DUP 6 is a blind field duplicate of soil sample RMM-TP24-SS1 for BTEX/TPH analysis
DUP 7 is a blind field duplicate of soil sample RMM-TP32-SS1 for BTEX/TPH analysis
DUP 11 is a blind field duplicate of soil sample RMM-TP8-SS1 for total cyanide analysis
DUP 12 is a blind field duplicate of soil sample RMM-TP19-SS1 for metals plus hydrides analysis

6.4 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for soil, groundwater and sediment samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix G-6. Sample locations are presented on Figure 6.2, Appendix A-6 and the Laboratory Certificates of Analyses are presented in Section 13.0.

6.4.1 Soil Sample Results

6.4.1.1 Petroleum Hydrocarbons in Soil

A total of 33 soil samples, plus three blind field duplicate sample (DUP 3, DUP 6 and DUP 7), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 6-1 to 6-7, Appendix G-6. The results are compared to the CCME-CEQG for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of ethylbenzene detected in soil samples RMM-TP23-SS3 (0.28 mg/kg) and RMM-MW6-SS3 (0.57 mg/kg) exceeded the CCME-CEQG of 0.08 mg/kg, but did not exceed the 2003 Atlantic Tier I RBSL of 430 mg/kg. Concentrations of BTEX in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

The concentration of modified TPH detected in soil sample RMM-TP5-SS1 (<12,200 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Hydrocarbons detected in soil resembled diesel fuel and heavy oil. Concentrations of modified TPH in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

6.4.1.2 Metals in Soil

A total of eight soil samples (RMM-TP1-SS2, RMM-TP16-SS1, RMM-TP17-SS3, RMM-TP19-SS1, RMM-TP26-SS1, RMM-TP29-SS4, RMM-TP30-SS1 and RMM-TP32-SS1), plus one blind field duplicate sample (DUP 12), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 6-8 and 6-9, Appendix G-6. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of arsenic detected in soil samples RMM-TP1-SS1 (162 mg/kg), RMM-TP16-SS1 (249 mg/kg), RMM-TP19-SS1 (116 mg/kg), RMM-TP26-SS1 (51.9 mg/kg), RMM-TP29-SS4 (21.7 mg/kg), RMM-TP32-SS1 (72.8 mg/kg) and DUP 12 (61.5 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of chromium detected in soil samples RMM-TP16-SS1 (153 mg/kg), RMM-TP29-SS4 (138 mg/kg), RMM-TP30-SS1 (88 mg/kg), RMM-TP32-SS1 (124 mg/kg) and DUP 12 (98 mg/kg) exceeded the applicable CCME-CEQG of 87 mg/kg.

Concentrations of copper detected in soil samples RMM-TP1-SS1 (3,550 mg/kg), RMM-TP16-SS1 (1,200 mg/kg), RMM-TP19-SS1 (2,200 mg/kg), RMM-TP26-SS1 (564 mg/kg), RMM-TP29-SS4 (1,570 mg/kg), RMM-TP30-SS1 (221 mg/kg), RMM-TP32-SS1 (396 mg/kg) and DUP 12 (1,580 mg/kg) exceeded the applicable CCME-CEQG of 91 mg/kg.

Concentrations of selenium detected in soil samples RMM-TP16-SS1 (8.7 mg/kg) and RMM-TP32-SS1 (6.5 mg/kg) exceeded the applicable CCME-CEQG of 3.9 mg/kg.

Concentrations of zinc detected in soil samples RMM-TP1-SS2 (1,660 mg/kg), RMM-TP19-SS1 (1,080 mg/kg) and DUP 12 (823 mg/kg) exceeded the applicable CCME-CEQG of 360 mg/kg.

6.4.1.3 Lead in Soil

A total of seven soil samples (RMM-TP5-SS1, RMM-TP11-SS2, RMM-TP14-SS1, RMM-TP15-SS1, RMM-TP21-SS3, RMM-TP23-SS3 and RMM-TP24-SS1) collected at the Site were analyzed for lead. The analytical results are presented in Tables 6-10 and 6-11, Appendix G-6. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of lead detected in all soil samples analyzed were detected at levels below the applicable assessment criterion of 600 mg/kg. Results ranged from 8 mg/kg (RMM-TP11-SS2) to 507 mg/kg (RMM-TP23-SS3).

6.4.1.4 PAHs in Soil

A total of five soil samples (RMM-TP5-SS1, RMM-TP14-SS1, RMM-TP29-SS4, RMM-TP30-SS1 and RMM-TP32-SS1), plus one blind field duplicate sample (DUP 5), collected at the Site were analyzed for PAHs. The analytical results are presented in Tables 6-12 and 6-13, Appendix G-6. The results are compared to the CCME-CEQG for industrial sites.

Concentrations of PAHs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

6.4.1.5 PCBs in Soil

A total of nine soil samples (RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP29-SS4, RMM-TP30-SS1, RMM-TP35-SS1, RMM-TP36-SS1, RMM-TP37-SS1, RMM-TP38-SS1 and RMM-TP39-SS1), plus one blind field duplicate sample (DUP C), collected at the Site were analyzed for PCBs. The analytical results are presented in Table 6-14 and 6-15, Appendix G-6. The results are compared to the CCME-CEQG of 33 mg/kg for PCBs in soil at industrial sites.

PCBs were not detected (<0.005 mg/kg) in any of the soil samples analyzed and therefore are below the applicable assessment criteria of 33 mg/kg.

6.4.1.6 Cyanide in Soil

A total of 10 soil samples (RMM-TP3-SS2, RMM-TP5-SS1, RMM-TP6-SS1, RMM-TP7-SS2, RMM-TP8-SS1, RMM-TP9-SS1, RMM-TP11-SS2, RMM-TP13-SS2, RMM-TP16-SS1 and RMM-TP18-SS2), plus two blind field duplicate samples (DUP 4 and DUP 11), collected at the Site were analyzed for total cyanide. The analytical results are presented in Tables 6-14 to 6-16, Appendix G-6. The results are compared to the CCME-CEQG of 8.0 for cyanide in soil at industrial sites.

The concentration of total cyanide detected in soil sample RMM-TP3-SS2 (21.0 mg/kg) exceeded the applicable CCME-CEQG of 8.0 mg/kg. Concentrations of cyanide in all other soil samples analyzed were detected at levels below the applicable assessment criterion.

6.4.2 Groundwater Sample Results

6.4.2.1 Petroleum Hydrocarbons in Groundwater

A total of six groundwater samples (RMM-MW1 to RMM-MW6) collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 6-19, Appendix G-6. The results are compared to the CCME-FAL guidelines (revised 2005) and the 2003 Atlantic PIRI Tier I RBSLs for groundwater at a commercial site with coarse-grained soil and non-potable groundwater.

Concentrations of BTEX and modified TPH in all groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criteria. Concentrations of modified TPH detected in groundwater ranged from <152 µg/L (RMM-MW4) to <1,360 µg/L (RMM-MW6). Petroleum hydrocarbons detected in groundwater resembled diesel fuel.

6.4.2.2 Metals in Groundwater

A total of six groundwater samples (RMM-MW1 to RMM-MW6) collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Table 6-20, Appendix G-6. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of metals detected in groundwater that exceeded the applicable CCME-FAL guidelines for metals in groundwater are listed below:

RMM-MW1

- Aluminum (648 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.432 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.342 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (826 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (5,150 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.072 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Mercury (0.0005 mg/L) exceeded the CCME-FAL of 0.0001 mg/L;
- Nickel (0.269 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Selenium (0.006 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Silver (0.0023 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (152 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

RMM-MW2

- Aluminum (2.57 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000399 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Iron (368 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.017 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.088 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0015 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (12.1 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

RMM-MW3

- Aluminum (14.6 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.074637 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.006 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (22.0 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (223 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.010 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Nickel (0.342 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0017 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (31.2 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

RMM-MW4

- Aluminum (0.088 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.00697 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (0.017 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (3.39 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Nickel (0.026 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0004 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (1.71 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

RMM-MW5

- Aluminum (1.63 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.015117 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Copper (4.76 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (0.35 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Nickel (0.117 mg/L) exceeded the CCME-FAL of 0.025 mg/L;
- Silver (0.0004 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (4.40 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

RMM-MW6

- Aluminum (0.133 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000108 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Copper (0.007 mg/L) exceeded the CCME-FAL of 0.002 mg/L;
- Iron (23.6 mg/L) exceeded the CCME-FAL of 0.3 mg/L;
- Lead (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L;
- Silver (0.0011 mg/L) exceeded the CCME-FAL of 0.0001 mg/L; and
- Zinc (0.415 mg/L) exceeded the CCME-FAL of 0.03 mg/L.

6.4.2.3 Cyanide in Groundwater

A total of six groundwater samples (RMM-MW1 to RMM-MW6) collected at the Site were analyzed for total cyanide. The analytical results are presented in Table 6-21, Appendix G-6. The results are compared to the CCME-FAL guideline Of 0.005 mg/L.

The concentration of cyanide detected is sample RMM-MW1 (0.148 mg/L) exceeded the applicable CCME-FAL guideline of 0.005 mg/L. Concentrations of cyanide in all other samples analyzed were either non-detect or detected at levels below the applicable assessment criterion of 0.005 mg/L.

6.4.2.4 General Water Chemistry in Groundwater

A total of six groundwater samples (RMM-MW1 to RMM-MW6) collected at the Site were analyzed for general water chemistry. The analytical results are presented in Table 6-22, Appendix G-6. The results are compared to the CCME-FAL guidelines (revised 2005).

Concentrations of fluoride detected in groundwater samples RMM-MW2 (1.2 mg/L), RMM-MW3 (1.5 mg/L) and RMM-MW5 (0.3 mg/L) exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

Concentrations of phenols detected in groundwater samples RMM-MW1 (0.006 mg/L) and RMM-MW5 (0.005 mg/L) exceeded the applicable CCME-FAL guideline of 0.004 mg/L.

Values of pH detected in all groundwater samples analyzed were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Values of pH detected in groundwater ranged from 2.06 (RMM-MW1) to 6.01 (RMM-MW4). This indicates that groundwater at the Site is acidic.

6.4.3 Sediment Sample Results

6.4.3.1 Petroleum Hydrocarbons in Sediment

A total of three freshwater sediment samples (RMM-SED1 to RMM-SED-3) collected from a drainage ditch/bog area located east of the maintenance garage and chemical laboratory present at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 6-23, Appendix G-6. There are no criteria available for the assessment of the BTEX/TPH in freshwater sediments. These parameters were assessed based on presence or absence.

BTEX were not detected in any of the sediment samples analyzed.

Modified TPH was detected in all sediment samples analyzed with concentrations in the range of <150 mg/kg (RMM-SED-1) to <1,340 mg/kg (RMM-SED-2). Petroleum hydrocarbon detected in sediment resembled heavy oil.

6.4.3.2 Metals in Sediment

A total of three freshwater sediment samples (RMM-SED1 to RMM-SED-3) collected from a drainage ditch/bog area located east of the maintenance garage and chemical laboratory present at the Site were analyzed for metals plus hydrides. The analytical results are presented in Table 6-24, Appendix G-6. The results are compared to the CCME Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments.

Concentrations of metals detected in sediment that exceeded the applicable CCME guidelines for freshwater sediments are listed below:

<u>RMM-SED1</u>

- Arsenic (43.6 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Chromium (91 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (273 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (109 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg); and
- Mercury (0.34 mg/kg) exceeded the CCME-ISQG.

RMM-SED2

- Arsenic (226 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (4.3 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Chromium (38 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg);
- Copper (5,510 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (510 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg);
- Mercury (3.09 mg/kg) exceeded the CCME-ISQG (0.17 mg/kg) and the CCME-PEL (0.486 mg/kg); and
- Zinc (754 mg/kg) exceeded the CCME-ISQG (123 mg/kg) and the CCME-PEL (315 mg/kg).

RMM-SED3

- Arsenic (1,780 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg) and the CCME-PEL (17.0 mg/kg);
- Cadmium (9.7 mg/kg) exceeded the CCME-ISQG (0.6 mg/kg) and the CCME-PEL (3.5 mg/kg);
- Copper (815 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg) and the CCME-PEL (197 mg/kg);
- Lead (123 mg/kg) exceeded the CCME-ISQG (35.0 mg/kg) and the CCME-PEL (91.3 mg/kg);
- Mercury (0.34 mg/kg) exceeded the CCME-ISQG; and
- Zinc (162 mg/kg) exceeded the CCME-ISQG (123 mg/kg).

6.4.3.3 PAHs in Sediment

A total of three freshwater sediment samples (RMM-SED1 to RMM-SED-3) collected from a drainage ditch/bog area located east of the maintenance garage and chemical laboratory present at the Site were analyzed for PAHs. The analytical results are presented in Table 6-25, Appendix G-6. The results are compared to the CCME-ISQGs and CCME-PELs for freshwater sediments.

Concentrations of PAHs were either non-detect or detected at levels below the applicable assessment criteria ion all sediment smaple4s analyzed.

6.4.3.4 PCBs in Sediment

A total of three freshwater sediment samples (RMM-SED1 to RMM-SED-3) collected from a drainage ditch/bog area located east of the maintenance garage and chemical laboratory present at the Site were analyzed for PCBs. The analytical results are presented in Table 6-25, Appendix G-6. The results are compared to the CCME-ISQGs and CCME-PELs for freshwater sediments.

PCBs were not detected in any of the sediment samples analyzed and therefore are below the applicable assessment criteria.

6.5 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) identified at the Site are provided.

6.5.1 Petroleum Hydrocarbons

The concentration of modified TPH detected in soil sample RMM-TP5-SS1 (<12,200 mg/kg), collected adjacent to and downgradient of the generator and two 910 L ASTs present on the east side of the Main Mill Building exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater (refer to Figure 6.2, Appendix A-6).

Even though there are no applicable criteria available for the assessment of TPH in freshwater sediment, it is important to note that the concentration of TPH (1,340 mg/kg) detected in sediment sample RMM-SED2, collected form the drainage ditch located directly east and downgradient of the Maintenance Garage present at the Site, is considered to be significant (refer to Figure 6.2, Appendix A-6).

6.5.2 Metals

Concentrations of a combination of metals detected in all soil, groundwater and sediment samples collected at the Site during the current investigation exceeded the applicable assessment guidelines. Based on the testing completed, metal impacts detected in all media sampled are considered to be widespread throughout the Site.

6.5.3 Cyanide

Soil
The concentration of total cyanide (21.0 mg/kg) detected in one soil sample (RMM-TP3-SS2) collected at the Site during the current investigation exceeded the applicable CCME-CEQG of 8.0 mg/kg. Soil sample RMM-TP3-SS2 was collected along the west side of the Main Mill Building (refer to Figure 6.2, Appendix A-6).

Groundwater
The concentration of total cyanide (0.146 mg/L) detected in one (RMM-MW1) of the six groundwater samples collected at the Site during the current investigation exceeded the applicable assessment criterion of 0.005 mg/L. Groundwater sample RMM-MW1 was collected on the northwest corner of the Main Mill Building (refer to Figure 6.2, Appendix A-6).

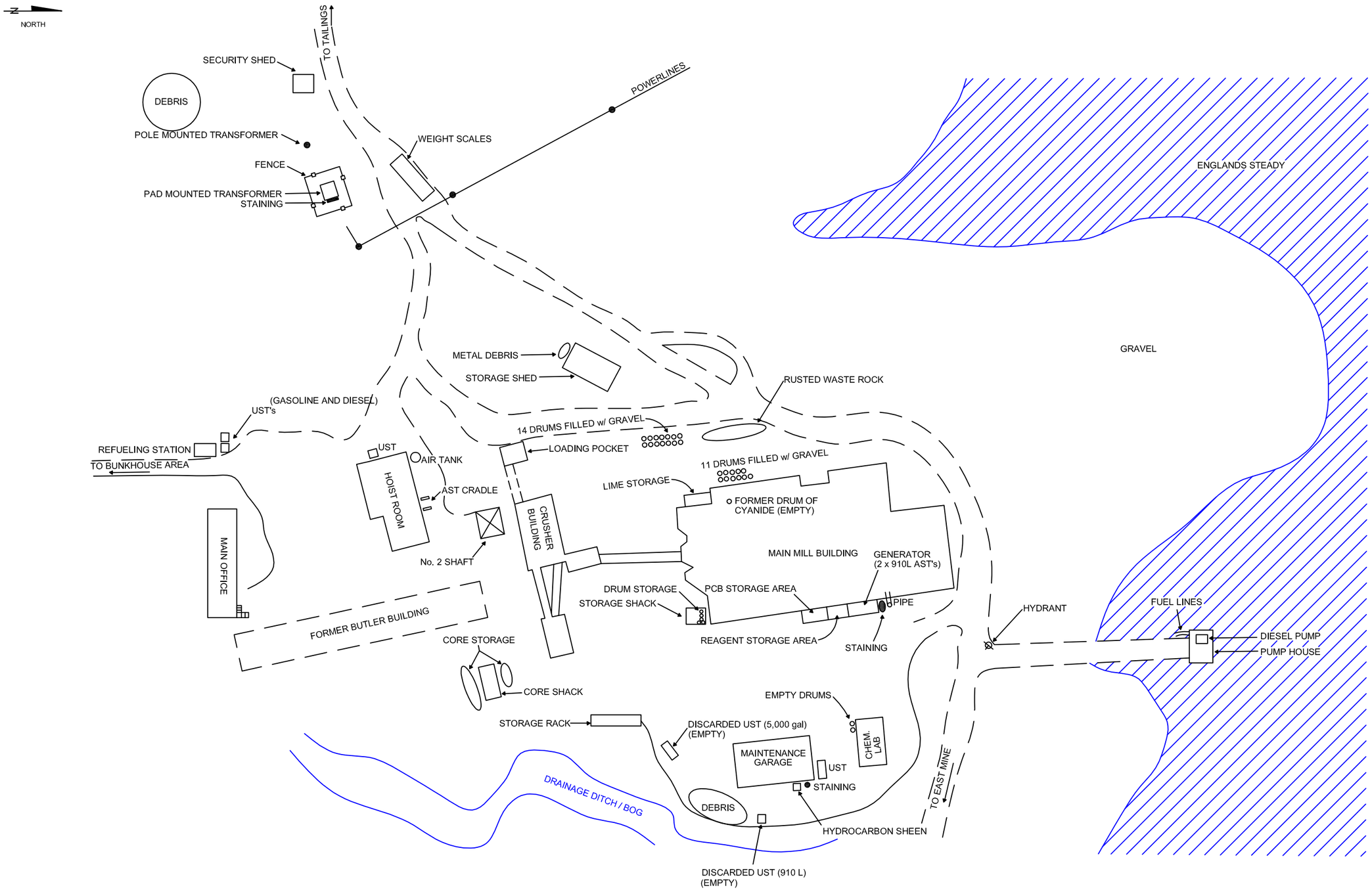
6.5.4 pH and General Chemistry

Groundwater
Values of pH (2.06 to 6.01) detected in all six groundwater samples collected at the Site during the current investigation were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater throughout the Site is acidic.

Concentrations of fluoride detected in groundwater samples RMM-MW2 (1.2 mg/L), RMM-MW3 (1.5 mg/L) and RMM-MW5 (0.3 mg/L) exceeded the applicable CCME-FAL guideline of 0.12 mg/L and the concentrations of phenols detected in groundwater samples RMM-MW1 (0.006 mg/L) and RMM-MW5 (0.005 mg/L) also exceeded the applicable CCME-FAL guideline of 0.004 mg/L.

APPENDIX A-6

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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LEGEND

GRAVEL ACCESS ROADS

STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

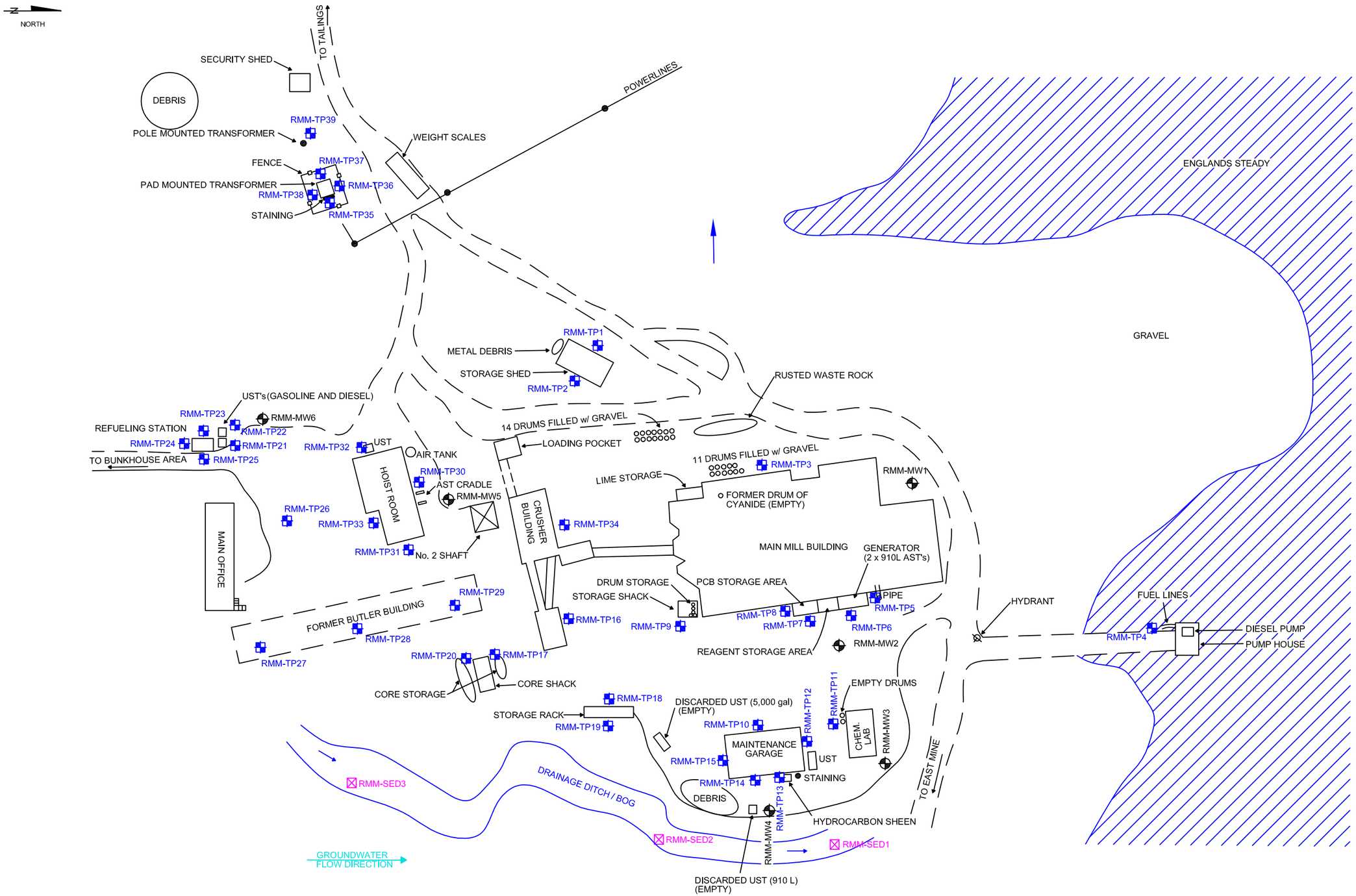
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MAIN MINE

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
6.1	January 2007	



NOTES

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LEGEND

- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL LOCATION
- TEST PIT LOCATION
- SEDIMENT SAMPLE LOCATION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MAIN MINE SAMPLE LOCATIONS

SCALE	PROJECT NUMBER
NTS	TF6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE NO.	DATE	REV
6.2	January 2007	

APPENDIX B-6

PHOTOGRAPHIC RECORD

Photo 1: Rambler Main Mine.

Photo 2: Main Mine Building.

Photo 3: Crusher Building.

Photo 4: Chemistry Laboratory.

Photo 5: Maintenance Garage.

Photo 6: Storage Shack.

Photo 7: Hoist Building.

Photo 8: Storage Shed.

Photo 9: Core Shack.

Photo 10: Refueling Station.

Photo 11: Security Shed.

Photo 12: Weight Scales.

Photo 13: Office Building.

Photo 14: Pumphouse.

Photo 15: Storage Rack.

Photo 16: Pad-Mounted Transformer.

Photo 17: Pole-Mounted Transformer.

Photo 18: Pumphouse – Diesel Powered Pump.

Photo 19: Pumphouse – Potential Fuel Lines.

Photo 20: 45-Gallon Drums Filled with Sand and Gravel.

Photo 21: 45-Gallon Drums Filled with Sand and Gravel.

Photo 22: Main Mill Building - Two 200-Gallon ASTs.

Photo 23: Main Mill Building - Generator.

Photo 24: Stain Area – Downgradient of Generator and ASTs.

Photo 25: PCB Storage Area and Reagent Storage Area.

Photo 26: Full Drums inside Storage Shed.
(Note the Discarded HazMat Suit)

Photo 27: Deteriorated Drums inside Storage Shed.
(Note the Discarded HazMat Suit)

Photo 28: Empty Drum inside Mill Building - Labeled Cyanide.

Photo 29: Deteriorated Drums Adjacent to Chemistry Laboratory.

Photo 30: Fill and Vent Pipes of an UST at North Side of the Maintenance Garage.

Photo 31: Stain Area at Rear of Maintenance Garage.
(Note Hole in Siding – Possible Fuel Line Hole)

Photo 32: Discarded 200-Gallon AST – Rear of Maintenance Garage.

Photo 33: Flooded Rear Entrance to Maintenance Garage.

Photo 34: Petroleum Hydrocarbon Sheen on Flood Water.

Photo 35: Discarded 5000-Gallon UST.

Photo 36: Drainage Ditch.
(Note Metal and Wood Debris)

Photo 37: AST Cradle – Hoist Building.

Photo 38: Potential Location of UST – Hoist Building.

Photo 39: Location of Gasoline and Diesel UST – Refueling Station.

APPENDIX C-6

MONITOR WELL AND TEST PIT LOGS

LOG OF MONITORING WELL RMM-MW1

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 7, 2006** DATE COMPLETED: **September 7, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
			FILL - Grey, sand and gravel with some fines, cobbles and boulders, traces of sulfur, debris, moist, compact. Sulfur odour.	STICK-UP: 0.90 (m)AGS DATE INSTALLED: September 7, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	58	32		UTM NAD27 East Coordinate: 565922 North Coordinate: 5527284
					2	SS	100	>50		
	1		BOULDERS and COBBLES - Grey, some sand and gravel, moist to saturated, compact to dense.		3	CORE	40	N/A		
	2			WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 2.82	4	CORE	100	88		

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

LOG OF MONITORING WELL RMM-MW2

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 7, 2006** DATE COMPLETED: **September 7, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
				STICK-UP: 0.11 (m)AGS						
	1		FILL - Grey / borwn, sand and gravel with some fines, some organics, wood debris, cobbles and boulders, moist to saturated, loose to compact. No hydrocarbon odour.	DATE INSTALLED: September 7, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	**1**	SS	58	25	7.9	UTM NAD27 East Coordinate: 565979 North Coordinate: 5527250
	2				**2**	SS	25	22	11.4	
					3	SS	33	21	13.5	
					4	SS	41	24	21.7	
				WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 0.97	**5**	SS	44	>50	15.8	

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

LOG OF MONITORING WELL RMM-MW3

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 7, 2006** DATE COMPLETED: **September 7, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
			FILL - Brown, sand and gravel with some fines, cobbles and boulders, moist, compact.	STICK-UP: 1.00 (m)AGS DATE INSTALLED: September 7, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	55	41		UTM NAD27 East Coordinate: 566022 North Coordinate: 5527273
	1		FILL - Grey and reddish brown, sand and gravel with some fines, cobbles and boulders, moist to saturated, compact to dense. No hydrocarbon odour.		2	SS	88	>50		
					3	SS	100	>50		
	2			WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 2.62						

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

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LOG OF MONITORING WELL RMM-MW4

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 8, 2006** DATE COMPLETED: **September 8, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
	0		FILL - Brown, sand and gravel with some fines, cobbles and boulders, moist to saturated, loose to compact to dense. No hdyrocarbon odour.	STICK-UP: 1.00 (m)AGS DATE INSTALLED: September 8, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	41	17	56.8	UTM NAD27 East Coordinate: 566032 North Coordinate: 5527238
	1				2	SS	0	9	N/A	
					3	SS	50	20	45.2	
	2			WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 3.00	4	SS	66	51	59.4	
					5	SS	77	>50	59.6	
	3				6	SS	100	>50	62.7	
			POSSIBLE BEDROCK - Grey, fractured.		7	CORE	100	54		
	4									

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

amec

LOG OF MONITORING WELL RMM-MW5

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 8, 2006** DATE COMPLETED: **September 8, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
			FILL - Reddish brown, sand and gravel with some fines, cobbles and boulders, moist, compact.	STICK-UP: 0.90 (m)AGS DATE INSTALLED: September 8, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	58	25	48.6	UTM NAD27 East Coordinate: 565924 North Coordinate: 5527127
					2	SS	50	>50	56.9	
	1		BOULDERS and COBBLES - Grey, some sand and gravel, moist, compact to dense.		3	CORE	32	N/A		
	2			WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 5.52						
	3		BEDROCK - Grey, fractured.		4	CORE	33	N/A		
	4				5	CORE	50	20		
▼										
	5				6	CORE	60	78		
	6									

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

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LOG OF MONITORING WELL RMM-MW6

PROJECT No.:	**TF6126508**	ELEVATION:	**.**
CLIENT:	**Department of Natural Resources**	DATUM:	
PROJECT NAME:	**Phase II ESA**	CONTRACTOR:	**Newfoundland Environmental Services**
LOCATION:	**Former Consolidated Rambler Mine**	EQUIPMENT:	**Open Stem Auger/HQ Coring**
DATE STARTED:	**September 8, 2006** DATE COMPLETED: **September 8, 2006**	LOGGED BY:	**K. Curtis**

ELEVATION (m)	DEPTH (m)	SYMBOL	STRATIGRAPHIC DESCRIPTION	INSTALLATION DATA	SAMPLES No.	SAMPLES TYPE	SAMPLES RECOVERY (%)	SAMPLES N-VALUE OR RQD (%)	SAMPLES .	REMARKS
	0		FILL - Reddish brown to grey, sand and gravel with some fines, cobbles and boulders, moist to saturated, loose to compact. Hydrocarbon odour present.	STICK-UP: 0.80 (m)AGS DATE INSTALLED: September 8, 2006 WELL CONSTRUCTION MATERIALS SCREEN: #20 50mm I.D. Sch. 40 PVC RISER: 50mm I.D. Sch. 40 PVC SANDPACK: No. 2 Silica Sand SEAL: 3/8" Bentonite Gravel TOP CAP: J-Plug BOTTOM CAP: End Cap LOCK?: N KEY No.: N/A	1	SS	52	8	232	UTM NAD27 East Coordinate: 565886 North Coordinate: 5527076
	1				2	SS	50	46	419	
				WATER LEVELS DATE: LEV.(m)btoc: ELEV.(m): Sept. 12/06 2.11	3	SS	50	26	557	
	2									
	3		BEDROCK - Grey, fracutred.		4	CORE	75	33		

VERTICAL SCALE: **1:40**

CHECKED BY: **G. Warren**

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Department of Natural Resources
Phase II Environmental Site Assessment
Rambler Main Mine

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP1	0.0 – 0.2	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.2 – 1.5	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.5 – 2.6	PEAT – Black, organics, saturated, loose.
	2.6	Test pit terminated in Peat.
		Note: 1) Groundwater encountered at 2.0 m. 2) No hydrocarbon odour present during excavation.
RMM-TP2	0.0 – 0.9	FILL – Reddish brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.9 – 1.1	PEAT – Black, organics, saturated, loose.
	1.1 – 1.8	FILL – Grey, SAND and GRAVEL wit some fines, cobbles and boulders, saturated, compact.
	1.8	Test pit terminated in Peat.
		Note: 1) Groundwater encountered at 1.0 m. 2) Hydrocarbon odour present during excavation.
RMM-TP3	0.0 – 1.8	FILL – Reddish brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose.
	1.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.6 m. 2) No hydrocarbon odour present during excavation.
RMM-TP4	0.0 – 1.0	FILL – Reddish brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP5	0.0 – 0.2	FILL – Reddish brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.2 – 1.3	FILL – Black to grey, SAND and GRAVEL with fines, cobbles and boulders, moist, loose.
	1.3	Test pit terminated on possible Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP6	0.0 – 0.4	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.4	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP7	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 1.3	FILL – Brown, SAND and GRAVEL with fines, cobbles and boulders, organics, moist, loose.
	1.3– 1.6	BEDROCK – Grey, fractured.
	1.6	Test pit terminated in Bedrock.
		Note: 1) Groundwater encountered at 1.2 m depth. 2) Hydrocarbon odour present during excavation.
RMM-TP8	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, metal debris, moist, loose.
	0.3 – 1.0	FILL – Brown, SAND and GRAVEL with fines, cobbles and boulders, wood debris, moist, loose.
	1.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP9	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP10	0.0 – 0.7	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP11	0.0 – 1.2	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.2 – 1.7	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.7 – 2.5	FILL – Dark brown to black, PEAT with some sand and gravel, cobbles and boulders, wood debris, moist saturated, loose.
	2.5	Test pit terminated in Peat.
		Note: 1) Groundwater encountered at 2.0 m depth. 2) No hydrocarbon odour present during excavation.
RMM-TP12	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 1.5	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.5 – 2.1	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	2.1 – 2.5	BEDROCK – Grey, fractured.
	2.5	Test pit terminated in Bedrock.
		Note: 1) Groundwater encountered at 2.1 m depth. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP13	0.0 – 0.2	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.2 – 1.5	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist tot saturated, loose to compact.
	1.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.2 m depth. 2) Hydrocarbon odour present during excavation.
RMM-TP14	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.3 – 0.7	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	0.7 – 1.1	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact to dense.
	1.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.0 m depth. 2) Hydrocarbon odour present during excavation.
RMM-TP15	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	0.3 – 0.9	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP16	0.0 – 0.6	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.6	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP17	0.0 – 1.6	FILL – Brownish grey, SAND and GRAVEL with fines, cobbles and boulders, moist, loose.
	1.6 – 2.8	FILL – Black, PEAT with some sand and gravel, wood debris, moist to saturated, loose.
	2.8 – 3.0	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact.
	3.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.8 m depth. 2) No hydrocarbon odour present during excavation.
RMM-TP18	0.0 – 0.1	FILL – Grey, SAND and GRAVEL with fines, moist, loose.
	0.1 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.3 – 0.9	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	0.9 – 1.9	FILL – Dark brown to black, PEAT with some sand and gravel, wood debris, saturated, compact.
	1.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.1 m depth. 2) No hydrocarbon odour present during excavation.
RMM-TP19	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.3 – 1.0	PEAT – Black, PEAT with some sand and gravel, saturated, loose.
	1.0	Test pit terminated in PEAT.
		Note: 1) Groundwater encountered at 0.4 m depth. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP20	0.0 – 1.0	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, wood debris, moist, loose.
	1.0 – 1.8	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.8 – 2.6	FILL – Dark brown to black, PEAT with some sand and gravel, wood debris, saturated, compact.
	2.6 – 3.0	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact.
	3.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.0 m depth. 2) No hydrocarbon odour present during excavation.
RMM-TP21	0.0 – 0.4	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.4 – 1.8	FILL – Reddish brown, SAND and GRAVEL with fines, cobbles and boulders, moist, loose.
	1.8 – 2.4	POSSIBLE GLACIAL TILL – Brown, SAND and GRAVEL with fines, cobbles and boulders, moist, compact.
	2.4	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP22	0.0 – 2.9	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	2.9 – 4.0	PEAT – Black, PEAT with some sand and gravel, wood debris, saturated, compact.
	4.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP23	0.0 – 0.2	FILL – Brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.2 – 2.5	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.5 – 3.0	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	3.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP24	0.0 – 0.8	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.8	Test pit terminated at Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP25	0.0 – 0.6	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.6 – 1.1	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP26	0.0 – 0.1	FILL – Light brown, SAND and GRAVEL with fines, cobbles, moist, loose.
	0.1 – 0.3	FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.3	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP27	0.0 – 0.9	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP28	0.0 – 2.0	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP29	0.0 – 3.4	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	3.4	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 3.1 m depth. 2) Hydrocarbon odour present at water table depth.
RMM-TP30	0.0 – 1.2	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.2	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation
RMM-TP31	0.0 – 0.2	FILL – Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.2 – 0.8	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP32	0.0 – 0.4	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.4	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation
RMM-TP33	0.0 – 0.2	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.2 – 0.5	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
RMM-TP34	0.0 – 0.2	FILL – Greyish yellow, SAND and GRAVEL with some fines, cobbles, moist, compact.
	0.2 – 0.8	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.8 – 1.8	FILL – Grey, BOULDERS and COBBLES with some gravel, moist, compact.
	1.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
RMM-TP35	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand around pad-mounted transformer.

Test Pit Identification Number	Depth From – To (m)	Soil Description
RMM-TP36	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand around pad-mounted transformer.
RMM-TP37	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand around pad-mounted transformer.
RMM-TP38	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand around pad-mounted transformer.
RMM-TP39	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit dug by hand underneath pole mounted transformer.

APPENDIX D-6

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – RAMBLER MAIN MINE

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)	COMMENTS (PETROLEUM HYDROCARBON ODOUR)
RMM-TP1	RMM-TP1-SS1	0.0 – 1.0	14.4	no odour
	RMM-TP1-SS2	1.5 – 2.5	17.2	no odour
RMM-TP2	RMM-TP2-SS1	0.0– 0.9	14.3	no odour
	RMM-TP2-SS2	1.0 – 1.8	18.0	slight odour
RMM-TP3	RMM-TP3-SS1	0.0 – 1.0	1.6	no odour
	RMM-TP3-SS2	1.0 – 1.75	1.9	no odour
RMM-TP4	RMM-TP4-SS1	0.0 – 1.0	2.8	no odour
RMM-TP5	RMM-TP5-SS1	0.0 – 1.0	6.7	strong odour
RMM-TP6	RMM-TP6-SS1	0.0 – 0.35	6.4.	no odour
RMM-TP7	RMM-TP7-SS1	0.0 – 1.0	4.9	slight odour
	RMM-TP7-SS2	1.0 – 1.4	158	strong odour
RMM-TP8	RMM-TP8-SS1	0.0 – 1.0	169	slight odour
RMM-TP9	RMM-TP9-SS1	0.0 – 0.3	87.3	no odour
RMM-TP10	RMM-TP10-SS1	0.0 – 0.7	7.5	no odour
RMM-TP11	RMM-TP11-SS1	0.0 – 1.0	8.4	no odour
	RMM-TP11-SS2	1.0 – 2.0	14.7	no odour
	RMM-TP11-SS3	2.0 – 2.5	8.4	no odour
RMM-TP12	RMM-TP12-SS1	0.0 – 1.0	22.0	slight odour
	RMM-TP12-SS2	1.0 – 2.0	6.3	slight odour
	RMM-TP12-SS3	2.0 – 2.5	7.7	no odour
RMM-TP13	RMM-TP13-SS1	0.0 – 1.0	4.2	no odour
	RMM-TP13-SS2	1.0 – 1.5	7.5	slight odour
RMM-TP14	RMM-TP14-SS1	0.0 – 1.0	2.6	slight odour
RMM-TP15	RMM-TP15-SS1	0.0 – 0.9	75.4	moderate odour
RMM-TP16	RMM-TP16-SS1	0.3 – 0.6	7.1	no odour
RMM-TP17	RMM-TP17-SS1	0.0 – 1.0	3.8	no odour
	RMM-TP17-SS2	1.0 – 2.0	7.1	no odour
	RMM-TP17-SS3	2.0 – 2.8	10.1	no odour
	RMM-TP17-SS4	2.8 – 3.0	7.1	no odour
RMM-TP18	RMM-TP18-SS1	0.0 – 1.0	7.8	no odour
	RMM-TP18-SS2	1.0 – 20.9	8.7	no odour
RMM-TP19	RMM-TP19-SS1	0.0 – 0.25	8.0	slight odour
	RMM-TP19-SS2	0.25 – 1.0	7.6	no odour
RMM-TP20	RMM-TP20-SS1	0.0 – 1.0	6.7	no odour
	RMM-TP20-SS2	1.0 – 2.0	8.7	no odour
	RMM-TP20-SS3	2.0 – 2.6	8.0	no odour
	RMM-TP20-SS4	2.6 – 3.0	10.4	no odour
RMM-TP21	RMM-TP21-SS1	0.0 – 1.0	4.2	no odour
	RMM-TP21-SS2	1.0 – 1.8	5.5	slight odour
	RMM-TP21-SS3	1.8 – 2.4	6.3	slight odour

Notes:
Shaded cells mean sample submitted for analyses.

PID READINGS OF SOIL SAMPLES – RAMBLER MAIN MINE (CONTINUED)

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)	COMMENTS (PETROLEUM HYDROCARBON ODOUR)
RMM-TP22	RMM-TP22-SS1	0.0 – 1.0	3.4	no odour
	RMM-TP22-SS2	1.0 – 2.0	2.6	no odour
	RMM-TP22-SS3	2.0 – 3.0	3.3	no odour
	RMM-TP22-SS4	3.0 – 4.0	2.2	no odour
RMM-TP23	RMM-TP23-SS1	0.0 – 1.0	4.6	no odour
	RMM-TP23-SS2	1.0 – 2.0	4.6	slight odour
	RMM-TP23-SS3	2.0 – 3.0	106.0	strong odour
RMM-TP24	RMM-TP24-SS1	0.0 – 0.8	45.6	strong odour
RMM-TP25	RMM-TP25-SS1	0.0 – 1.0	10.3	no odour
RMM-TP26	RMM-TP26-SS1	0.0 – 0.3	8.4	no odour
RMM-TP27	RMM-TP27-SS1	0.0 – 0.39	8.9	no odour
RMM-TP28	RMM-TP28-SS1	0.0 – 1.0	6.3	no odour
	RMM-TP28-SS2	1.0 – 2.0	9.5	no odour
RMM-TP29	RMM-TP29-SS1	0.0 – 1.0	7.9	no odour
	RMM-TP29-SS2	1.0 – 2.0	7.9	no odour
	RMM-TP29-SS3	2.0 – 3.0	2.7	no odour
	RMM-TP29-SS4	3.0 – 3.4	20.1	moderate odour
RMM-TP30	RMM-TP30-SS1	0.0 – 1.0	8.4	no odour
RMM-TP31	RMM-TP31-SS1	0.0 – 0.75	11.0	no odour
RMM-TP32	RMM-TP32-SS1	0.0 – 0.4	20.9	slight odour
RMM-TP33	RMM-TP33-SS1	0.0 – 0.5	52.6	slight odour
RMM-TP34	RMM-TP34-SS1	0.0 – 0.8	9.4	no odour
RMM-TP35	RMM-TP35-SS1	0.0 – 0.3	4.8	no odour
RMM-TP36	RMM-TP36-SS1	0.0 – 0.3	6.4	no odour
RMM-TP37	RMM-TP37-SS1	0.0 – 0.3	2.1	no odour
RMM-TP38	RMM-TP38-SS1	0.0 – 0.3	34.0	no odour
RMM-TP39	RMM-TP39-SS1	0.0 – 0.3	37.0	no odour

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-6

FIELD PH, TEMPERATURE AND CONDUCTANCE DATA

Field Temperature, pH and Conductance Groundwater Data - Rambler Main Mine

MW Location	RMM-MW1			RMM-MW2			RMM-MW3		
Date	13-Sep-06			13-Sep-06			13-Sep-06		
Cumulative Volume Purged (L)	5.0	10.0	15.0	5.0	10.0	15.0	5.0	10.0	15.0
Field pH	2.26	2.26	2.27	5.72	5.68	5.64	4.81	4.66	4.62
Field Temp (Degrees C)	10.9	11.4	11.6	11.8	11.2	11.2	10.0	10.9	11.0
Field Conductance (uS/cm)	7330	7340	7380	1905	1857	1842	1929	1837	1892

MW Location	RMM-MW4			RMM-MW5			RMM-MW6		
Date	13-Sep-06			13-Sep-06			13-Sep-06		
Cumulative Volume Purged (L)	5.0	10.0	15.0	10.0	20.0	30.0	5.0	10.0	15.0
Field pH	6.32	6.33	6.34	5.37	5.03	5.02	5.66	5.96	5.95
Field Temp (Degrees C)	11.0	10.1	9.9	8.6	8.4	8.7	10.30	11.10	11.30
Field Conductance (uS/cm)	1255	1236	1187	943	916	916	997	942	925

APPENDIX F-6

GPS COORDINATES

GPS COORDINATES - NAD27 - RAMBLER MAIN MINE

Location	Northing	Easting
RMM-TP1	565870	5527186
RMM-TP2	565887	5527181
RMM-TP3	565912	5527226
RMM-TP4	565981	5527941
RMM-TP5	565971	5527254
RMM-TP6	565974	5527253
RMM-TP7	565980	5527232
RMM-TP8	565974	5527202
RMM-TP9	565971	5527206
RMM-TP10	566005	5527223
RMM-TP11	566005	5527250
RMM-TP12	566008	5527249
RMM-TP13	566020	5527237
RMM-TP14	566023	5527230
RMM-TP15	566014	5527211
RMM-TP16	565967	5527168
RMM-TP17	565989	5527149
RMM-TP18	566006	5527185
RMM-TP19	566007	5527197
RMM-TP20	565982	5527137
RMM-TP21	565901	5527061
RMM-TP22	565898	5527058
RMM-TP23	565897	5527048
RMM-TP24	565910	5527044
RMM-TP25	565913	5527052
RMM-TP26	565940	5527081
RMM-TP27	565966	5527084
RMM-TP28	565965	5527106
RMM-TP29	565953	5527129
RMM-TP30	565931	5527124
RMM-TP31	565939	5527116
RMM-TP32	565905	5527107
RMM-TP33	565930	5527101
RMM-TP34	565939	5527169
RMM-MW1	565922	5527284
RMM-MW2	565979	5527250
RMM-MW3	566022	5527273
RMM-MW4	566032	5527238
RMM-MW5	565324	5527127
RMM-MW6	565886	5527076
RMM-SED1	566044	5527254
RMM-SED2	565991	5527159
RMM-SED3	565995	5527095

APPENDIX G-6

LABORATORY ANALYSES TABLES

Table 6-1: BTEX/TPH in Soil - Rambler Main Mine

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			1.5 - 2.5	1.0 - 1.8	1.0 - 1.8	1.0 - 1.75	0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-10579	S2006-10580	S2006-10595	S2006-10596	S2006-10597	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	RMM-TP1-SS2	RMM-TP2-SS2	DUP 3	RMM-TP3-SS2	RMM-TP4-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)			06-Sep-06	06-Sep-06	06-Sep-06	07-Sep-06	07-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	0.26	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	14	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	26	<10 (<10)	<10	<10	25	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	234	<50 (<50)	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	274	<70	<70	<70	<85	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	Chromatogram resembles diesel and heavy oil	-	-	-	Chromatogram resembles weathered diesel				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 3 is a blind field duplicate of soil sample RMM-TP2-SS2

Table 6-2: BTEX/TPH in Soil - Rambler Main Mine

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 1.0	0 - 0.35	1.0 - 1.4	0 - 0.7	1.0 - 2.0	0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10598	S2006-10599	S2006-10600	S2006-10603	S2006-10604	S2006-10605	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP5-SS1	RMM-TP6-SS1	RMM-TP7-SS2	RMM-TP10-SS1	RMM-TP11-SS2	RMM-TP12-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	0.26	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	16	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	992	<10	183	<10	<10	3340	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	11200	597	<50	110	<50	632	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	**<12200**	<617	<249	<130	<70	<3980	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel	Chromatogram resembles heavy oil	-	Chromatogram resembles heavy oil diesel				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-3: BTEX/TPH in Soil - Rambler Main Mine

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		1.0 - 1.5	0 - 1.0	0 - 0.9	0.3 - 0.6	2.0 - 2.8	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10606	S2006-10607	S2006-10608	S2006-10609	S2006-10613	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP13-SS2	RMM-TP14-SS1	RMM-TP15-SS1	RMM-TP16-SS1	RMM-TP17-SS3	INDUSTRIAL SITES			
DATE (D/M/Y)		07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	08-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	0.04	<0.01	<0.01	0.05	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	0.03	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	0.26	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	21	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	296	294	<10	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	502	462	<50	51	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<808	777	<70	<71	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram shows trace of heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-4: BTEX/TPH in Soil - Rambler Main Mine

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		1.0 - 1.9	0 - 0.25	2.6 - 3.0	1.8 - 2.4	0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10614	S2006-10615	S2006-10616	S2006-10617	S2006-10618	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP18-SS2	RMM-TP19-SS1	RMM-TP20-SS4	RMM-TP21-SS3	RMM-TP22-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	0.07	<0.01	<0.01	<0.01	0.07	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	1080	<10	238	23	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	188	4940	<50	93	150	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<208	<6030	<70	<341	<183	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil diesel	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles weathered diesel	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-5: BTEX/TPH in Soil - Rambler Main Mine

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		2.0 - 3.0	0 - 0.8	0 - 0.8	0 - 1.0	0 - 0.8	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10619	S2006-10620	S2006-10626	S2006-10621	S2006-10622	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP23-SS3	RMM-TP24-SS3	DUP 6	RMM-TP25-SS1	RMM-TP26-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	0.05	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	**0.28**	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	6.72	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	34	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	987	2700	2610	<10	28	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	3890	1400	1490	<50	200	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	4910	<4110	<4110	<70	<238	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 6 is a blind field duplicate of soil sample RMM-TP24-SS3

Table 6-6: BTEX/TPH in Soil - Rambler Main Mine

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 0.9	1.0 - 2.0	3.0 - 3.4	1.2 - 1.8	0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10623	S2006-10624	S2006-10625	S2006-10628	S2006-10645	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP27-SS1	RMM-TP28-SS2	RMM-TP29-SS4	RMM-MW6-SS3	RMM-TP30-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	09-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	**0.57**	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	83	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	15	<10	2670	1700	33	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	70	<50	513	122	335	-	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<95	<70	<3190	1910	<378	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil	-	Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles diesel	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-7: BTEX/TPH in Soil - Rambler Main Mine

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 0.75	0 - 0.4	0 - 0.4	0 - 0.5	0 - 0.8	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-10646	S2006-10647	S2006-10650	S2006-10648	S2006-10649	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		RMM-TP31-SS1	RMM-TP32-SS1	DUP 7	RMM-TP33-SS1	RMM-TP34-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	94	985	1340	1450	53	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	437	591	685	1060	392	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<541	<1590	<2040	<2520	<455	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-8: Metals in Soil - Rambler Main Mine

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.5 - 2.5 S2006-10579 RMM-TP1-SS2 06-Sep-06	0.3 - 0.6 S2006-10609 RMM-TP16-SS1 07-Sep-06	2.0 - 2.8 S2006-10613 RMM-TP17-SS3 08-Sep-06	0 - 0.25 S2006-10615 RMM-TP19-SS1 08-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	2550	14600	15000	14900	**-**
Antimony	0.5	<0.5	1.6	2.5	<0.5	2.0	**40**
Arsenic	0.5	<0.5	**162**	**249**	1.6	**116**	**12**
Barium	0.5	<0.5	38.6	5.7	31.2	24.6	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	0.2	<0.2	**8**
Bismuth	0.2	<0.2	0.6	1.4	<0.2	2.2	**-**
Cadmium	0.5	<0.5	8.6	1.6	<0.5	3.9	**22**
Calcium	25	<25	1560	455	5560	914	**-**
Chromium	1	<1	52	**153**	25	79	**87**
Cobalt	1	<1	15	17	10	15	**300**
Copper	1	<1	**3550**	**1200**	60	**2200**	**91**
Iron	5	<5	37100	59600	5290	98500	**-**
Lead	5	<5	50	32	<5	214	**600**
Magnesium	10	<10	1780	16000	453	14900	**-**
Manganese	1	<1	69	246	116	202	**-**
Mercury	0.01	<0.01	0.17	0.08	0.08	0.45	**50**
Molybdenum	2	<2	2	2	<2	8	**40**
Nickel	5	<5	7	29	28	21	**50**
Phosphorus	5	<5	1050	272	328	597	**-**
Potassium	10	<10	77	261	25	1360	**-**
Selenium	0.1	<0.1	0.3	**8.7**	0.8	0.8	**3.9**
Silver	0.25	<0.25	0.91	0.38	<0.25	0.55	**40**
Sodium	25	<25	56	123	115	153	**-**
Vanadium	5	<5	19	83	5	73	**130**
Zinc	2	<2	**1660**	40	115	**1080**	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-9 Metals in Soil - Rambler Main Mine

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.25	0 - 0.3	3.0 - 3.4	0 - 1.0	0 - 0.4	1999 CCME RECOMMENDED
LAB ID		S2006-10627	S2006-10622	S2006-10625	S2006-10645	S2006-10647	SOIL QUALITY GUIDELINES
FIELD ID		DUP 12	RMM-TP26-SS1	RMM-TP29-SS4	RMM-TP30-SS1	RMM-TP32-SS1	INDUSTRIAL (Revised 2005)
DATE (D/M/Y)		08-Sep-06	08-Sep-06	08-Sep-06	09-Sep-07	09-Sep-08	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	18100	18900	19700	18100	13900	**-**
Antimony	0.5	2.7	3.1	2.4	1.7	2.4	**40**
Arsenic	0.5	**61.5**	**51.9**	**21.7**	11.1	**72.8**	**12**
Barium	0.5	20.8	71.3	24.0	8.0	17.5	**2000**
Beryllium	0.2	<0.2	0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	1.3	1.0	0.9	0.2	0.5	**-**
Cadmium	0.5	2.7	0.8	0.9	<0.5	0.7	**22**
Calcium	25	805	3160	1120	2380	817	**-**
Chromium	1	**98**	21	**138**	**88**	**124**	**87**
Cobalt	1	15	20	13	19	15	**300**
Copper	1	**1580**	**564**	**1570**	**221**	**396**	**91**
Iron	5	61800	44700	73300	48100	46100	**-**
Lead	5	132	64	30	9	54	**600**
Magnesium	10	18400	17400	21300	14100	14900	**-**
Manganese	1	244	554	260	416	345	**-**
Mercury	0.01	0.24	0.17	0.09	0.08	0.16	**50**
Molybdenum	2	5	2	3	<2	2	**40**
Nickel	5	25	10	27	12	29	**50**
Phosphorus	5	483	1010	714	576	411	**-**
Potassium	10	879	4630	1590	248	708	**-**
Selenium	0.1	0.4	0.8	0.6	0.2	**6.5**	**3.9**
Silver	0.25	0.61	0.62	0.96	<0.25	<0.25	**40**
Sodium	25	128	220	313	233	136	**-**
Vanadium	5	74	92	70	89	67	**130**
Zinc	2	**823**	198	209	84	98	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 12 is a blind field duplicate of soil sample RMM-TP19-SS1

Table 6-10: Lead in Soil - Rambler Main Mine

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.1	1.0 - 2.0	0 - 1.0	
LAB ID			S2006-10598	S2006-10604	S2006-10607	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	RMM-TP5-SS1	RMM-TP11-SS2	RMM-TP14-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			07-Sep-06	07-Sep-06	07-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Lead	5.0	<5.0	81	8	241	**600**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-11: Lead in Soil - Rambler Main Mine

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.9	1.8 - 2.4	2.0 - 3.0	0 - 0.8	
LAB ID		S2006-10608	S2006-10617	S2006-10619	S2006-10620	1999 CCME RECOMMENDED
FIELD ID		RMM-TP15-SS1	RMM-TP21-SS3	RMM-TP23-SS3	RMM-TP24-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		07-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Lead	5.0	121	17	**507**	13	**600**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-12: PAHs in Soil - Rambler Mine Site

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	0 - 1.0 S2006-10598 RMM-TP5-SS1 07-Sep-06	0 - 1.0 S2006-10611 DUP 5 07-Sep-06	0 - 1.0 S2006-10607 RMM-TP14-SS1 07-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	0.036	0.022	<0.002	**22**
Acenaphthylene	0.001	<0.001	0.037	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	0.035	0.012	<0.001	**-**
Phenanthrene	0.001	<0.001	0.093	0.036	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-13: PAHs in Soil - Rambler Mine Site

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		3.0 - 3.4 S2006-10625 RMM-TP29-SS4 08-Sep-06	0 - 1.0 S2006-10645 RMM-TP30-SS1 09-Sep-06	0 - 0.4 S2006-10647 RMM-TP32-SS1 09-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-14: PCBs in Soil - Rambler Main Mine

		DATA						GUIDELINES
AVERAGE SAMPLING DEPTH (m)			1.0 - 1.4	0 - 1.0	3.0 - 4.0	0 - 1.0	0 - 0.3	
LAB ID			S2006-10600	S2006-10601	S2006-10625	S2006-10645	S2006-10883	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	RMM-TP7-SS2	RMM-TP8-SS1	RMM-TP29-SS4	RMM-TP30-SS1	RMM-TP35-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			07-Sep-06	07-Sep-06	08-Sep-06	09-Sep-06	11-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-15: PCBs in Soil - Rambler Main Mine

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	
LAB ID		S2006-10884	S2006-10885	S2006-10886	S2006-10888	S2006-10887	1999 CCME RECOMMENDED
FIELD ID		RMM-TP36-SS1	RMM-TP37-SS1	RMM-TP38-SS1	Dup C	RMM-TP39-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005 (<0.005)	<0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP C is a blind field duplicate of soil sample RMM-TP38-SS1

Table 6-16: Cyanide in Soil - Rambler Main Mine

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)			1.0 - 1.75	0 - 1.0	0 - 0.35	1.0 - 1.4	
LAB ID			S2006-10596	S2006-10598	S2006-10599	S2006-10600	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	RMM-TP3-SS2	RMM-TP5-SS1	RMM-TP6-SS1	RMM-TP7-SS2	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	<0.001	**21.0**	0.629	2.66	0.034	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-17: Cyanide in Soil - Rambler Main Mine

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 1.0	0 - 1.0	0 - 0.3	0 - 0.3	
LAB ID		S2006-10601	S2006-10612	S2006-10602	S2006-10610	1999 CCME RECOMMENDED
FIELD ID		RMM-TP8-SS1	DUP 11	RMM-TP9-SS1	DUP 4	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	0.441	0.318	0.579	0.260	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 4 is a blind field duplicate of soil sample RMM-TP9-SS1
DUP 11 is a blind field duplicate of soil sample RMM-TP8-SS1

Table 6-18: Cyanide in Soil - Rambler Main Mine

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		1.0 - 2.0	1.0 - 1.5	0.3 - 0.6	1.0 - 1.9	
LAB ID		S2006-10604	S2006-10606	S2006-10609	S2006-10614	1999 CCME RECOMMENDED
FIELD ID		RMM-TP11-SS2	RMM-TP13-SS2	RMM-TP16-SS1	RMM-TP18-SS2	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cyanide	0.001	0.318	0.264	0.152	0.343	**8.0**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 6-19: BTEX/TPH in Groundwater - Rambler Main Mine

		DATA							GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10852 RMM-MW1 12-Sep-06	S2006-10853 RMM-MW2 13-Sep-06	S2006-10854 RMM-MW3 13-Sep-06	S2006-10855 RMM-MW4 13-Sep-06	S2006-10856 RMM-MW5 13-Sep-06	S2006-10857 RMM-MW6 13-Sep-06	CCME CEQGs (REVISED 2005) FAL	2003 ATLANTIC PIRI TIER I RBSL*
PARAMETERS	MDL (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**370**	**6900**
Toluene	0.4	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	0.3	**2**	**20000**
Ethylbenzene	0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	54.9	**90**	**20000**
Total Xylene	0.8	<0.8	1.0	<0.8	0.9	0.7	0.9	3.5	**-**	**20000**
TPH (C6-C10)	50	<50	<50	<50	<50	<50	<50	<50	**-**	**-**
TPH (>C10-C21)	50	<50	<50	<50	<50	<50	<50	1260	**-**	**-**
TPH (>C21-<C32)	50	<50	<50	<50	<50	52	<50	<50	**-**	**-**
Modified TPH (C6-C32)	150	<150	<150	<150	<150	<152	<150	<1360	**-**	**20000**
Hydrocarbon Identification		-	-	-	-	Too low to identify	-	Chromatogram resembles diesel		

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold faced guidelines reflect those most applicable to current land use designation
Bold and underlined data exceeds the CCME-FAL
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
-: VALUE NOT ESTABLISHED
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable

Table 6-20: Metals Plus Hydrides in Groundwater - Rambler Main Mine

		DATA							GUIDELINES
LAB ID REPORT ID DATE		Lab Blank	S2006-10852 RMM-MW1 13-Sep-06	S2006-10853 RMM-MW2 13-Sep-06	S2006-10854 RMM-MW3 13-Sep-06	S2006-10855 RMM-MW4 13-Sep-06	S2006-10856 RMM-MW5 13-Sep-06	S2006-10857 RMM-MW6 13-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**648**	**2.57**	**14.6**	**0.088**	**1.63**	**0.133**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	**0.005**
Barium	0.001	<0.0005	0.001	0.019	0.011	0.035	0.032	0.035	**-**
Beryllium	0.001	<0.0001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.432**	**0.000399**	**0.074637**	**0.00697**	**0.015117**	**0.000108**	**0.000017**
Calcium	0.5	<0.5	599	484	652	480	202	207	**-**
Chromium	0.001	<0.001	**0.342**	**0.003**	**0.006**	0.001	0.001	**0.003**	**0.001**
Cobalt	0.001	<0.001	3.79	0.158	0.475	0.049	0.066	0.023	**-**
Copper	0.001	<0.001	**826**	**0.001**	**22.0**	**0.017**	**4.76**	**0.007**	**0.002-0.004**
Iron	0.01	<0.001	**5150**	**368**	**223**	**3.39**	**0.35**	**23.6**	**0.3**
Lead	0.002	<0.002	**0.072**	**0.017**	**0.010**	<0.002	<0.002	**0.003**	**0.001-0.007**
Magnesium	0.02	<0.02	616	89.3	133	37.6	36.6	38.6	**-**
Manganese	0.001	<0.001	32.9	39.9	43.2	12.6	14.4	26.7	**-**
Mercury	0.0001	<0.0001	**0.0005**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Molybdenum	0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	**0.269**	**0.088**	**0.342**	**0.026**	**0.117**	0.013	**0.025-0.15**
Phosphorus	0.02	<0.002	62.1	0.30	0.27	<0.02	0.04	0.04	**-**
Potassium	0.02	<0.02	0.59	16.3	2.42	10.0	10.8	9.29	**-**
Selenium	0.001	<0.001	**0.006**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	**0.0023**	**0.0015**	**0.0017**	**0.0004**	**0.0004**	**0.0011**	**0.0001**
Sodium	0.5	<0.5	11.4	24.3	18.1	14.6	16.2	10.8	**-**
Vanadium	0.005	<0.002	0.341	0.008	0.010	<0.005	<0.005	0.005	**-**
Zinc	0.005	<0.001	**152**	**12.1**	**31.2**	**1.71**	**4.40**	**0.415**	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria

Table 6-21: Cyanide in Groundwater - Rambler Main Mine

		DATA							GUIDELINES
Lab ID			S2006-10852	S2006-10853	S2006-10854	S2006-10855	S2006-10856	S2006-10857	CCME-CEQGs
FIELD ID		Lab Blank	RMM-MW1	RMM-MW2	RMM-MW3	RMM-MW4	RMM-MW5	RMM-MW6	(REVISED 2005)
DATE			12-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Cyanide	0.001	<0.001	**0.148**	0.002	0.002	0.002	<0.001	0.001	**0.005**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 6-22: General Water Chemistry in Groundwater - Rambler Main Mine

		DATA							GUIDELINES
LAB ID			S2006-10852	S2006-10853	S2006-10854	S2006-10855	S2006-10856	S2006-10857	CCME-CEQGs
FIELD ID		Lab Blank	RMM-MW1	RMM-MW2	RMM-MW3	RMM-MW4	RMM-MW5	RMM-MW6	(REVISED 2005)
DATE (D/M/Y)			13-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06	FAL
PARAMETERS	Units								
Ammonia	(mg/L)	<0.01	1.94 (2.07)	1.55	1.78	1.03	0.03 (0.03)	0.52	-
Chloride	(mg/L)	<0.1	7.3	6.2	8.2	6.5	5.5	2.3	-
Conductivity	(µS/cm)	<5	10800	2170	2760	1590	1080	1170	-
Fluoride	(mg/L)	<0.1	<1.0 **	**1.2**	**1.5**	0.1	**0.3**	0.1	**0.12**
Hardness as CaCO3	(mg/L)	<0.3	4030	1580	2180	1350	655	676	-
Nitrate as N	(mg/L)	<0.05	<1.0 **	<0.05	0.34	<0.05	0.78	0.40	**13**
Nitrite as N	(mg/L)	<0.015	<0.05	<0.015	<0.015	<0.015	<0.015	<0.015	**0.06**
pH		7.86	**2.06**	**4.45**	**4.39**	**6.01**	**4.58**	**5.91**	**6.5-9**
Phenols	(mg/L)	<0.001	**0.006**	0.001	0.002	<0.001	<0.001	**0.005**	**0.004**
Sulphate	(mg/L)	<0.1	13700	1210	2870	1490	770	838	-
Total Alkalinity (CaCO3)	(mg/L)	<5	<5	<5	<5	100	<5	86	-
Total Dissolved Solids	(mg/L)	<10	4450	2860	3940	1850	1100	1220	-
Total Suspended Solids	(mg/L)	<2	466	6530	28000	9630	778	12300	-
Cation Balance	(meq)	-	89.7	33.0	44.4	28.0	14.1	14.2	-
Anion Balance	(meq)	-	285	25.5	60.1	33.2	16.3	19.3	-
Ion Balance	(%)	-	-52.1	13.0	-15.0	-8.52	-7.32	-15.1	-
Calcium	(mg/L)	<0.5	599	484	652	480	202	207	-
Magnesium	(mg/L)	<0.02	616	89.3	113	37.6	36.6	38.6	-
Potassium	(mg/L)	<0.02	0.59	16.3	2.42	10.0	10.8	9.29	-
Sodium	(mg/L)	<0.5	11.4	24.3	18.1	14.6	16.2	10.8	-

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
FAL: Freshwater Aquatic Life
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds the CCME FAL Criteria

Table 6-23. BTEX/TPH in Freshwater Sediment - Rambler Main Mine

		DATA				GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10654 RMM SED-1 09-Sep-06	S2006-10655 RMM SED-2 09-Sep-06	S2006-10656 RMM SED-3 09-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	-	-
Total Xylene	0.06	<0.06	<0.06	<0.06	<0.06	-	-
TPH (C6-C10)	10	<10	<10	<10	<10	-	-
TPH (>C10-C21)	10	<10	10	186	<10	-	-
TPH (>C21-<C32)	50	<50	130	1140	181	-	-
Total TPH	70	<70	<150	<1340	<201	-	-
Hydrocarbon Identification		-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil		

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED

Table 6-24. Metals Plus Hydrides in Freshwater Sediment - Rambler Main Mine

		DATA				GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10654 RMM SED-1 09-Sep-06	S2006-10655 RMM SED-2 09-Sep-06	S2006-10656 RMM SED-3 09-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	10800	8540	3490	-	-
Antimony	0.5	<0.5	1.8	14.2	8.5	-	-
Arsenic	0.5	<0.5	**43.6**	**226**	**1780**	**5.9**	**17**
Barium	0.5	<0.5	19.8	19.9	56.0	-	-
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	-	-
Bismuth	0.2	<0.2	0.4	5.0	3.4	-	-
Cadmium	0.5	<0.5	<0.5	**4.3**	**9.7**	**0.6**	**3.5**
Calcium	25	<25	463	4060	893	-	-
Chromium	1	<1	**91**	**38**	31	**37.3**	**90**
Cobalt	1	<1	11	29	9	-	-
Copper	1	<1	**273**	**5510**	**815**	**37.5**	**197**
Iron	5	<5	45200	108000	180000	-	-
Lead	5	<5	**109**	**510**	**123**	**35**	**91.3**
Magnesium	10	<10	11500	7830	2620	-	-
Manganese	1	<1	195	150	169	-	-
Mercury	0.01	<0.01	**0.34**	**3.09**	**0.34**	**0.17**	**0.486**
Molybdenum	2	<2	4	12	6	-	-
Nickel	5	<5	21	12	6	-	-
Phosphorus	5	<5	261	586	2540	-	-
Potassium	10	<10	887	1180	1680	-	-
Selenium	0.1	<0.1	3.3	0.3	0.8	-	-
Silver	0.25	<0.25	0.30	0.43	0.98	-	-
Sodium	25	<25	173	125	430	-	-
Vanadium	5	<5	63	39	53	-	-
Zinc	2	<2	60	**754**	**162**	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 6-25. PAH in Freshwater Sediment - Rambler Main Mine

		DATA				GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-10654 RMM SED-1 09-Sep-06	S2006-10655 RMM SED-2 09-Sep-06	S2006-10656 RMM SED-3 09-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.004	<0.002	**0.0346**	**0.391**
Acenaphthylene	0.001	<0.001	<0.001	<0.002	<0.001	**0.00587**	**0.128**
Acenaphthene	0.002	<0.002	<0.002	<0.004	<0.002	**0.00671**	**0.0889**
Fluorene	0.001	<0.001	<0.001	<0.002	<0.001	**0.0212**	**0.144**
Phenanthrene	0.001	<0.001	<0.001	<0.002	0.011	**0.0419**	**0.515**
Anthracene	0.001	<0.001	<0.001	<0.002	<0.001	**0.0469**	**0.245**
Fluoranthene	0.001	<0.001	<0.001	<0.002	0.021	**0.111**	**2.355**
Pyrene	0.003	<0.003	0.003	<0.002	0.010	**0.053**	**0.875**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.002	0.016	**0.0317**	**0.385**
Chrysene	0.001	<0.001	<0.001	<0.002	<0.001	**0.0571**	**0.862**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.008	<0.004	**-**	**-**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.008	<0.004	**-**	**-**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.006	<0.003	**0.0319**	**0.782**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.006	<0.003	**-**	**-**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.008	<0.004	**0.00622**	**0.135**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.004	<0.002	**-**	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 6-26. PCB in Freshwater Sediment - Rambler Main Mine

		DATA				GUIDELINES	
LAB ID		Lab Blank	S2006-10654 RMM	S2006-10655 RMM	S2006-10656 RMM	1999 CCME RECOMMENDED CANADIAN SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
FIELD ID			SED-1	SED-2	SED-3		
DATE (D/M/Y)			09-Sep-06	09-Sep-06	09-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005 (<0.005)	<0.05 *	<0.005	**0.0341**	**0.2770**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
(#): Data in brackets indicate laboratory replicate sample results
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)
* Higher MDL reported due to dilution factor of 10

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APPENDICES

7.0 AREA F – BUNKHOUSE AREA

7.1 SITE DESCRIPTION

The Bunkhouse Area is located approximately 200 m south of the Main Mine and consists of four main structures; a cookhouse, two bunkhouses and a staff housing unit (refer to Figure 7.1, Appendix A-7 and Photos 1 to 4, Appendix B-7). All Site buildings were observed to be in poor condition at the time of the site inspection. Two pole-mounted transformers, an oil stove, several propane tanks and a partially buried underground storage tanks (UST) were also observed at the Site.

7.2 PHASE I ESA SITE INSPECTION – AMEC JUNE 2006

Since the Bunkhouse Area (Mining Lease 145) was not assessed during the previous Phase I ESA competed for the Site in March 2005, the DNRMD requested that AMEC conduct a Phase I ESA site inspection to identify any potential environmental concerns at the Site and develop a Phase II ESA sampling program for the Site.

The Phase I ESA site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). Please note that since the Site buildings (i.e. bunkhouses, cook house and staff house) are not owned by the Crown, they were excluded from this investigation. The following information and observations were recorded by AMEC at the time of the initial site inspection:

- Two pole-mounted transformers were observed at the Site, one at the west side of Bunkhouse No.2 and another at the northwest corner of the Staff House (refer to Figure 7.1, Appendix A-7 and Photos 5 and 6, Appendix B-7). These transformers may contain PCBs;
- A partially buried UST was observed on the southwest corner of Bunkhouse No.2 (refer to Figure 7.1, Appendix A-7 and Photo 7, Appendix B-7);
- A wooden platform, possibly a former AST holding pad, was also observed on the southwest corner of the Cookhouse (refer to Figure 7.1, Appendix A-7 and Photo 8, Appendix B-7); and
- An oil stove was observed inside the Cookhouse and a moderate hydrocarbon odour was observed along the exterior (south wall) of the structure (refer to Figure 7.1, Appendix A-7 and Photo 9, Appendix B-7);
- A discarded UST was observed in the woods approximately 20 m south of the Staff House (refer to Figure 7.1, Appendix A-7 and Photo 10, Appendix B-7); and
- Evidence of forced air furnace duct-work was observed within both bunkhouses present at the Site. Even though fuel oil storage tanks were not identified along the perimeter of Bunkhouse No.1 and the Cookhouse, it is possible that they may have existed at the Site in the past;
- The Staff House was heated by electric baseboard heaters; and
- Four propane tanks were observed on the southside of Bunkhouse No.2 and one propane tank was observed on the southwest corner of the Staff House (refer to Figure 7.1, Appendix A-7 and Photos 11 and 12, Appendix B-7).

7.3 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

7.3.1 Scope of Work

Based on the information and observations recorded during the Phase I ESA site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Excavating four test pits (BH-TP1 to BH-TP4) along the perimeter of Bunkhouse No.1 and collecting soil samples for BTEX/TPH and lead analyses to assess potential impacts due to historical fuel handling and storage at the Site (refer to Figure 7.2, Appendix A-7);
- Excavating four test pits (BH-TP5 to BH-TP8) along the perimeter of the Cookhouse and collecting soil samples for BTEX/TPH and lead analyses to assess potential impacts due to historical fuel handling and storage at the Site (refer to Figure 7.2, Appendix A-7);
- Excavating one test pit (BH-TP9) at the suspect location of an oil-fired forced-air furnace within the crawl space of Bunkhouse No.2 and collecting soil samples for BTEX/TPH and lead analyses (refer to Figure 7.2, Appendix A-7);
- Excavating one test pit (BH-TP10) adjacent to the partially buried UST identified on the southwest corner of Bunkhouse No.2 and collecting soil samples for BTEX/TPH and lead analyses (refer to Figure 7.2, Appendix A-7);
- Excavating one test pit (BH-TP12) at the location of a discarded UST observed in the woods approximately 20 m south of the Staff House and collecting soil samples for BTEX/TPH and lead analyses (refer to Figure 7.2, Appendix A-7);
- Collecting two surface soil samples (BH-TP11 and BH-TP13) underneath two pole-mounted transformers identified at the Site for PCB analyses (refer to Figure 7.2, Appendix A-7);
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figure 7.2, Appendix A-7.

7.3.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

7.3.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness brown, reddish brown and grey gravel and sand with some cobbles and trace organics, boulders and silt. Wood debris was encountered in test pits BH-TP2 to BH-TP7 and BH-TP12. Thickness of the soil present at the Site ranged from 0.6 m (BH-TP3 and BH-TP6) to 2.0 m (BH-TP9) below the ground surface (bgs). Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-7.

7.3.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for soil vapour headspace (SVH). SVH readings report the concentrations of volatile organic vapours being released from the soils. SVH readings ranged from 2.8 parts per million (ppm) to 408 ppm (refer to Appendix D-7). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

7.3.2.3 Groundwater Conditions

Groundwater was encountered in two (BH-TP1 and BH-TP12) of the 13 test pits excavated at the Site at depths of ranging from 0.8 m (BH-TP12) to 1.0 m (BH-TP1) bgs. Based on the topography of the Site, groundwater flow direction at the Site has been inferred to be in a northerly direction, towards the Rambler Main Mine property.

7.3.2.4 Contaminant Observations

Petroleum Hydrocarbon Odours
A strong petroleum hydrocarbon odour was observed during the excavation of test pit BH-TP5 (refer to Figure 7.2, Appendix A-7). Petroleum hydrocarbon odours were not observed in any of the remaining 12 test pits excavated at the Site.

Free Phase Petroleum Hydrocarbon Product
No free phase petroleum hydrocarbon product was observed on the water table within any of the test pits excavated at the Site. Groundwater was not encountered within 11 of the 13 test pits excavated at the Site.

7.3.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-7.

7.3.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Bunkhouse Area is outlined in Table 7-1 below.

Table 7-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Soil	BH-TP1-SS2, BH-TP2-SS1, BH-TP3-SS1, BH-TP4-SS1, BH-TP5-SS2, BH-TP6-SS1, BH-TP7-SS1, BH-TP8-SS1, BH-TP9-SS2, BH-TP10-SS2, BH-TP12-SS1, BH-TP1-SS2, BH-TP1-SS2, DUP B	BTEX/TPH and Lead
	BH-TP11-SS1, BH-TP13-SS1	PCB

Note:
DUP B is a blind field duplicate of soil sample BH-TP5-SS2 for BTEX/TPH analysis

7.4 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-7. Sample locations are presented on Figure 7.2, Appendix A-7 and the Laboratory Certificates of Analyses are presented in Section 13.0.

7.4.1 Soil Sample Results

7.4.1.1 Petroleum Hydrocarbons in Soil

A total of 11 soil samples (BH-TP1-SS2, BH-TP2-SS1, BH-TP3-SS1, BH-TP4-SS1, BH-TP5-SS2, BH-TP6-SS1, BH-TP7-SS1, BH-TP8-SS1, BH-TP9-SS2, BH-TP10-SS2 and BH-TP12-SS1), plus one blind field duplicate sample (DUP B), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 7-1 to 7-3, Appendix F-7. The results are compared to the applicable CCME-CEQGs for industrial sites and the 2003 Atlantic PIRI Tier I RBCA RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of BTEX and TPH were either non-detect or detected at levels below the applicable assessment criteria in all soil samples analyzed. Concentrations of modified TPH detected in soil ranged from <82 mg/kg (BH-TP2-SS1) to <3,120 mg/kg (BH-TP5-SS2). Petroleum hydrocarbons detected in soil at the Site resembled weathered diesel fuel.

7.4.1.2 Lead in Soil

A total of 11 soil samples (BH-TP1-SS2, BH-TP2-SS1, BH-TP3-SS1, BH-TP4-SS1, BH-TP5-SS2, BH-TP6-SS1, BH-TP7-SS1, BH-TP8-SS1, BH-TP9-SS2, BH-TP10-SS2 and BH-TP12-SS1) collected at the Site were analyzed for lead. The analytical results are presented in Tables 7-4 and 7-5, Appendix F-7. The results are compared to the applicable CCME-CEQG for industrial sites.

Concentrations of lead detected in all soil samples analyzed were either non-detect (<5.0 mg/kg) or detected at levels below the applicable assessment criterion of 600 mg/kg for industrial sites. Concentrations of lead detected in soil ranged from 5.0 mg/kg (BH-TP5-SS2) to 34.0 mg/kg (BH-TP2-SS1).

7.4.1.3 PCBs in Soil

A total of two soil samples collected underneath two pole-mounted transformers identified at the Site were analyzed for PCBs. The analytical results are presented in Table 7-6, Appendix F-7. The results are compared to the applicable CCME-CEQG of 33.0 mg/kg for PCBs in soil at industrial sites.

PCBs were not-detected (<0.005 mg/kg) in any of the soil samples analyzed and therefore below the applicable assessment criterion of 33.0 mg/kg.

7.5 DISCUSSION OF RESULTS

Based on the findings of this Phase II ESA, the following discussions of contaminants investigated are provided in this section.

7.5.1 Petroleum Hydrocarbons

Concentrations petroleum hydrocarbons detected in soil at all locations tested were either non-detect or detected at levels below the applicable assessment criteria.

7.5.2 Lead

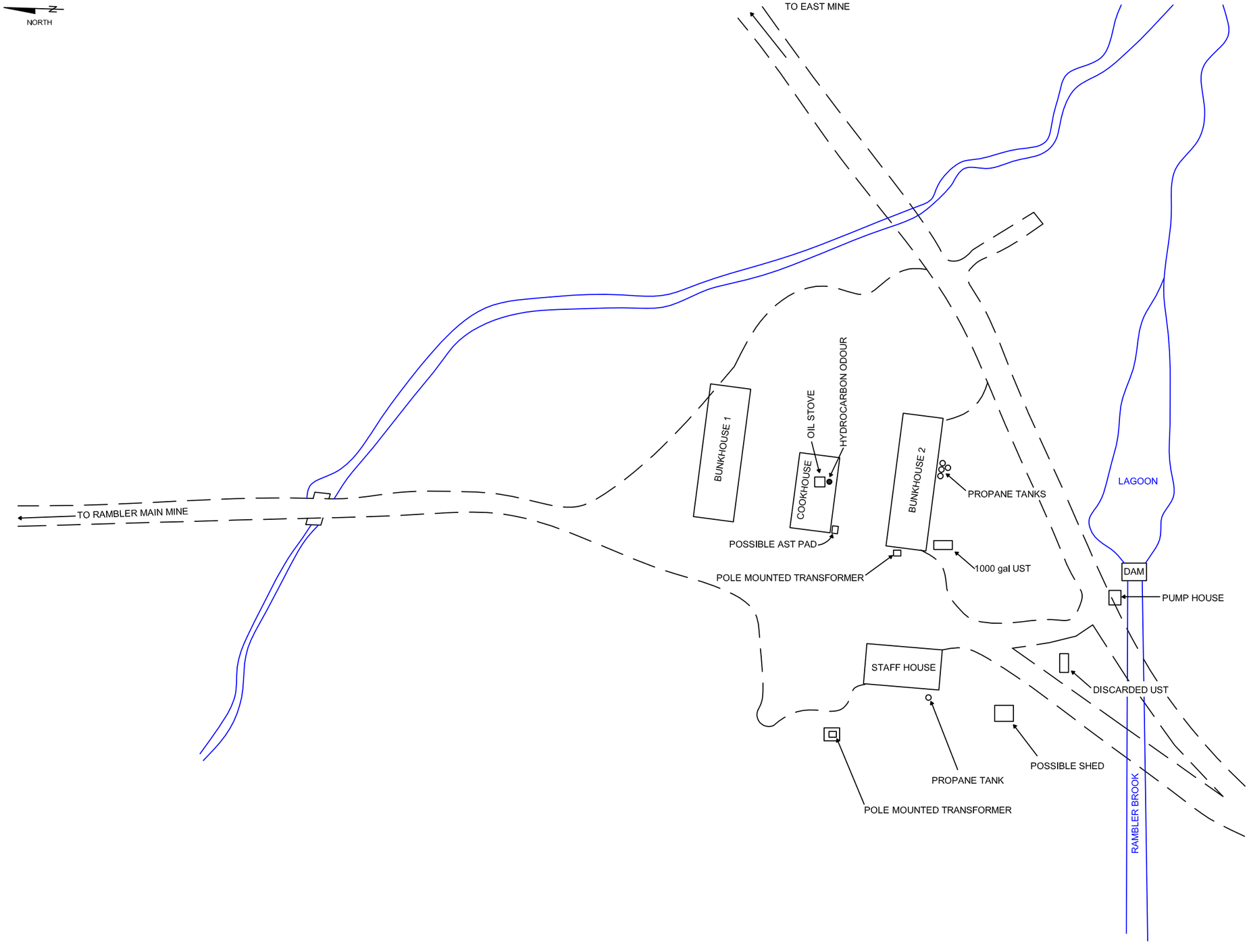
Concentrations lead detected in soil at all locations tested were either non-detect or detected at levels below the applicable assessment criteria.

7.5.3 PCBs

PCBs were not-detected in any of the soil sample collected from underneath the two pole-mounted transformers identified at the site and therefore below the applicable assessment criteria.

APPENDIX A-7

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS

STREAM / WATER BODY

CLIENT

DEPARTMENT OF NATURAL RESOURCES

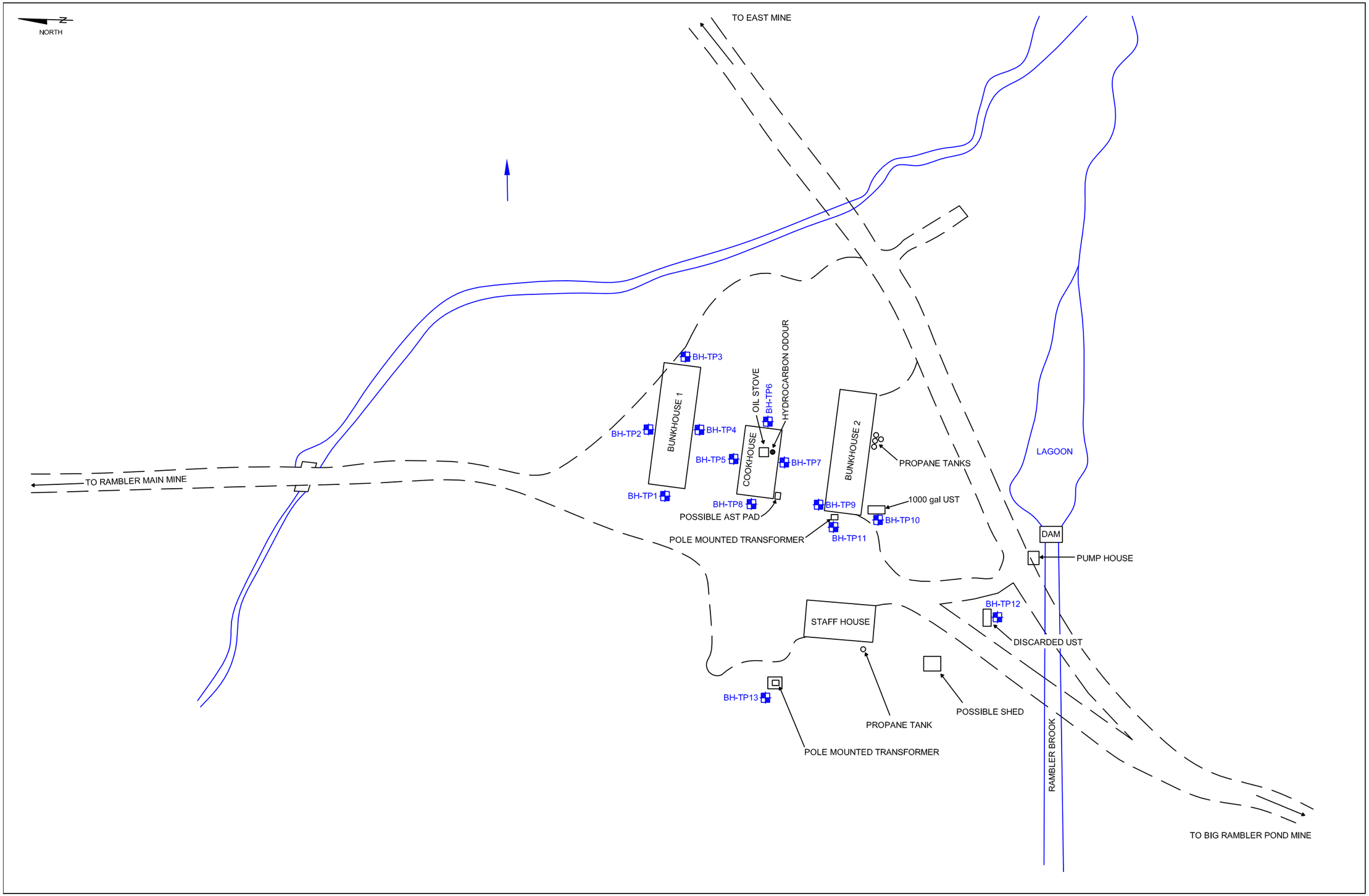
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MINE BUNK HOUSE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
7.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- TEST PIT LOCATION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

RAMBLER MINE BUNK HOUSE AREA
SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126508	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
FIGURE NO.	DATE	REV
7.2	January 2007	

APPENDIX B-7

PHOTOGRAPHIC RECORD

Photo 1: Bunkhouse No.1.

Photo 2: Bunkhouse No.2.

Photo 3: Cook House.

Photo 4: Staff House.

Photo 5: Transformer #1.
(West of Bunkhouse No.2)

Photo 6: Transformer #2.
(Northwest of Staff House)

Photo 7: UST Located on Southwest Corner of
Bunkhouse No. 2.

Photo 8: Potential AST Holding Pad on Southwest
Corner of the Cookhouse.

Photo 9: Oil Stove inside Cook House.
(Note Hydrocarbon Odour Observed at this Location)

Photo 10: Discarded UST in Woods Southwest of Staff House.

Photo 11: Four Propane Tanks.
(Southside of Bunkhouse No.2)

Photo 12: Propane Tank.
(Southeast Corner of Staff House)

APPENDIX C-7

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
Bunkhouse Area

Test Pit Identification Number	Depth From – To (m)	Soil Description
BH-TP1	0.0 – 0.3	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.3 – 1.0	FILL - Dark brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	1.0 – 1.7	FILL – Grey, SAND and GRAVEL with fines, cobbles and boulders, saturated, compact.
	1.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.
BH-TP2	0.0 – 1.0	FILL – Black, PEAT with some sand and gravel, wood debris, cobbles and boulders, moist, loose.
	1.0 – 1.2	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.2	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP3	0.0 – 0.1	FILL – Black, PEAT with some sand and gravel, wood debris, cobbles, moist, loose.
	0.1 – 0.7	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP4	0.0 – 0.7	FILL – Brown, SAND and GRAVEL with some sand and gravel, organics, wood debris, cobbles, moist, loose.
	0.7 – 0.9	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
BH-TP5	0.0 – 0.9	FILL – Brown, SAND and GRAVEL with some sand and gravel, organics, wood debris, cobbles, moist, loose.
	0.9 – 1.5	GLACIAL TILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Strong hydrocarbon odour present during excavation.
BH-TP6	0.0 – 0.1	FILL – Brown, SAND and GRAVEL with some sand and gravel, organics, wood debris, cobbles, moist, loose.
	0.1 – 0.7	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	0.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP7	0.0 – 1.0	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, organics, wood debris, cobbles, moist, loose.
	1.0 – 1.2	PEAT – Brown, organics, moist, loose.
	1.2	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP8	0.0 – 1.0	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, cobbles and boulders, moist, compact.
	1.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
BH-TP9	0.0 – 0.6 0.6 – 2.0 2.0	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, organics, cobbles and boulders, moist, compact. FILL – Light brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP10	0.0 – 1.7 1.7	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, cobbles and boulders, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP11	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, cobbles and boulders, moist, compact. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
BH-TP12	0.0 – 1.0 1.0	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, organics, wood debris, cobbles and boulders, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater encountered at 0.8 m depth. 2) No hydrocarbon odour present during excavation.
BH-TP13	0.0 – 0.3 0.3	FILL – Reddish brown, SAND and GRAVEL with some sand and gravel, cobbles and boulders, moist, compact. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

APPENDIX D-7

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – BUNKHOUSE AREA

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)	COMMENTS (PETROLEUM HYDROCARBON ODOUR)
BH-TP1	BH-TP1-SS1	0.0 – 1.0	4.8	no odour
	BH-TP1-SS2	1.0 – 1.7	17.3	no odour
BH-TP2	BH-TP2-SS1	0.0 – 1.2	6.5	no odour
BH-TP3	BH-TP3-SS1	0.0 – 0.7	22.3	no odour
BH-TP4	BH-TP4-SS1	0.0 – 0.9	3.3	no odour
BH-TP5	BH-TP5-SS1	0.0 – 0.9	284	strong odour
	BH-TP5-SS2	0.9 – 1.5	408	strong odour
BH-TP6	BH-TP6-SS1	0.0 – 0.7	2.8	no odour
BH-TP7	BH-TP7-SS1	0.2 – 1.2	3.7	no odour
BH-TP8	BH-TP8-SS1	0.0 – 1.0	2.8	no odour
BH-TP9	BH-TP9-SS1	0.0 – 1.0	3.5	no odour
	BH-TP9-SS2	1.0 – 2.0	3.6	no odour
BH-TP10	BH-TP10-SS1	0.0 – 1.0	4.3	no odour
	BH-TP10-SS2	1.0 – 1.7	10.2	no odour
BH-TP11	BH-TP11-SS1	0.0 – 0.3	13.4	no odour
BH-TP12	BH-TP12-SS1	0.0 – 1.0	3.1	no odour
BH-TP13	BH-TP13-SS1	0.0 – 0.3	13.3	no odour

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-7

GPS COORDINATES

GPS COORDINATES - NAD27 - BUNKHOUSE AREA

Location	Northing	Easting
BH-TP1	565902	5526914
BH-TP2	565907	5526916
BH-TP3	565933	5526892
BH-TP4	565919	5526903
BH-TP5	565912	5526893
BH-TP6	565922	5526879
BH-TP7	565912	5526874
BH-TP8	565896	5526893
BH-TP9	565875	5526873
BH-TP10	565889	5526802
BH-TP11	565891	5526871
BH-TP12	565859	5526819
BH-TP13	565844	5526877

APPENDIX F-7

LABORATORY ANALYSES TABLES

Table 7-1: BTEX/TPH in Soil - Bunkhouse Area

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			1.0 - 1.7	0 - 1.2	0 - 0.7	0 - 0.9	1999 CCME-CEQG	2003 ATLANTIC PIRI		
Lab ID			S2006-10889	S2006-10890	S2006-10891	S2006-10892	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Lab Blank	BH-TP1-SS2	BH-TP2-SS1	BH-TP3-SS1	BH-TP4-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)			11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10 (<10)	22	<10	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50 (<50)	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	<82	<70	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles weathered diesel	-	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
(#): Data in brackets indicate laboratory replicate sample results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 7-2: BTEX/TPH in Soil - Bunkhouse Area

		DATA				GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.9 - 1.5	0.9 - 1.5	0 - 0.7	0.2 - 1.2	1999 CCME-CEQG	2003 ATLANTIC PIRI		
Lab ID		S2006-10893	S2006-10903	S2006-10894	S2006-10895	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		BH-TP5-SS2	DUP B	BH-TP6-SS1	BH-TP7-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	0.03	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	420	282	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	2650	2610	669	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<3120	<2940	<729	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel	Chromatogram resembles diesel	Chromatogram resembles diesel	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
(#): Data in brackets indicate laboratory replicate sample results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP B is a blind field duplicate of soil sample BH-TP5-SS2

Table 7-3: BTEX/TPH in Soil - Bunkhouse Area

		DATA				GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0 - 1.0	1.0 - 2.0	1.0 - 1.7	0 - 0.3	1999 CCME-CEQG	2003 ATLANTIC PIRI		
Lab ID		S2006-10896	S2006-10897	S2006-10898	S2006-10900	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		BH-TP8-SS1	DUP B	BH-TP10-SS2	BH-TP12-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10	25	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	<85	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles weathered diesel	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
(#): Data in brackets indicate laboratory replicate sample results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 7-4: Lead in Soil - Bunkhouse Area

		DATA						GUIDELINES
AVERAGE SAMPLING DEPTH (m)			1.0 - 1.7	0 - 1.2	0 - 0.7	0 - 0.9	0.9 - 1.5	
LAB ID			S2006-10889	S2006-10890	S2006-10891	S2006-10892	S2006-10893	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	BH-TP1-SS2	BH-TP2-SS1	BH-TP3-SS1	BH-TP4-SS1	BH-TP5-SS2	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	12-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)						(mg/kg)
Lead	5.0	<5.0	6 (6)	34	8	<5	5	**600**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 7-5: Lead in Soil - Bunkhouse Area

		DATA						GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0 - 0.7	0.2 - 1.2	0 - 1.0	1.0 - 2.0	1.0 - 1.7	0 - 0.3	
LAB ID		S2006-10894	S2006-10895	S2006-10896	S2006-10897	S2006-10898	S2006-10900	1999 CCME RECOMMENDED
FIELD ID		BH-TP6-SS1	BH-TP7-SS1	BH-TP8-SS1	BH-TP9-SS2	BH-TP10-SS2	BH-TP12-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	12-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Lead	5.0	13	<5	29	6	<5	12	**600**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 7-6: PCBs in Soil - Bunkhouse Area

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0 - 0.3	0 - 0.3	
LAB ID			S2006-10899	S2006-10901	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	BH-TP11-SS1	BH-TP13-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			11-Sep-06	11-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

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APPENDICES

8.0 AREA G – ACCESS ROADS

8.1 SITE DESCRIPTION

Reportedly, potential acid generating (PAG) waste rock from the mining operations was used for grading and construction of all access roads connecting the different mining areas present at the Site. For the purposes of this investigation the access roads were divided into the following five roadways (refer to Figure 8.1, Appendix A-8):

- Main Access Road (MAR);
- Alternate Access Road (AAR);
- East Mine Access Road (EMR);
- Big Pond Rambler Access Road (BRP); and
- Tailings Access Road (TAIL).

8.2 PREVIOUS ENVIRONMENTAL INVESTIGATION

A review of the Phase I ESA completed at the Site in March 2005 revealed the following potential environmental concerns regarding the access roads at the Site:

- Several structures on-Site are built with PAG waste rock from the mining operations. Uses of the waste rock include, but are not limited to, construction of roads connecting the mining sites, construction of dykes and Site grading.

Based on the findings of the Phase I ESA, it was recommended that rock/soil samples be collected from the areas of the access roads expected to be constructed using sulphide bearing waste rock materials to determine the presence/absence of acid generating materials within the roadways.

8.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 22, 2006. At the time of the initial site inspection, AMEC personnel were accompanied by Mr. Alex Smith, P.Eng. of the DNRMD (herein referred to as the Site representative). The following information and observations were recorded by AMEC at the time of the initial site inspection:

- PAG waste rock was observed throughout all access roads present at the Site (refer to Photos 1 to 4, Appendix B-8). The rocks appeared to by a rusty (red/orange/purple) in colour; and
- Stressed and dead vegetation was observed at several locations along the sides of the access roads, an indicator of acid rock drainage (refer to Photos 1, 5 and 6, Appendix B-8).

8.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 6 to 13, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

8.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting four rock samples from each of the five access road identified at the Site for acid base accounting (ABA) analyses;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

8.4.2 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix C-8.

8.4.3 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed along the Site access roadways is outlined in Table 8-1 below.

Table 8-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Rock	EMR-WR1, EMR-WR2, EMR-WR3, EMR-WR4 TAIL-WR1, TAIL-WR2, TAIL-WR3, TAIL-WR4, MAR-WR1, MAR-WR2, MAR-WR3, MAR-WR4, ARR-WR1, ARR-WR2, ARR-WR3, ARR-WR4, BRP-WR3, BRP-WR4, BRP-WR53, BRP-WR6, DUP-1	Acid Base Accounting

Notes:
DUP-1 is a blind field duplicate of waste rock sample EMR-WR2

8.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for the rock samples collected from the Site access roadways during the current investigation. Tables summarizing the analytical results are presented in Appendix D-8. Sample locations are presented on Figure 8.2, Appendix A-8 and the Laboratory Certificates of Analyses are presented in Section 13.0. The difference between the two values, Acid Potential (AP) and Neutralizing Potential (NP), is the rock's Net Neutralization Potential (Net NP). A negative Net NP indicates that the rock is acid producing.

8.5.1 Roadway Rock Sample Results

8.5.1.1 ABA Results – Main Access Road

Four roadway rock samples (MAR-WR1 to MAR-WR4) collected along the Main Access Road to the Rambler Mine were analyzed for ABA using the Sobek Testing Method. The analytical results are presented in Table 8-1, Appendix D-8.

The analytical results revealed a negative value for Net NP for two (MAR-WR1 and MAR-WR3) of the four waste rock samples analyzed, indicating that PAG waste rock was used in the construction of the Main Access Road to the Rambler Mine. Although samples MAR-WR2 and MAR-WR4 had positive net NP values, the NP/AP ratios were less than 4.0 and therefore should also be considered PAG, given a safety factor of 4.0 (Price, 1997).

8.5.1.2 ABA Results – Alternate Access Road

Four roadway rock samples (AAR-WR1 to AAR-WR4) collected along the Alternate Access Road to the Rambler Mine were analyzed for ABA using the Sobek Testing Method. The analytical results are presented in Table 8-1, Appendix D-8.

The analytical results revealed a negative value for Net NP for all four rock samples analyzed, indicating that PAG waste rock was used in the construction of the Alternate Access Road to the Rambler Mine. The NP/AP ratio for all rock samples analyzed was less than 4.0 and therefore should be considered PAG, given a safety factor of 4.0 (Price, 1997).

8.5.1.3 ABA Results – East Mine Access Road

Four roadway rock samples (AAR-WR1 to AAR-WR4), plus one blind field duplicate sample (DUP-1), collected along the East Mine Access Road were analyzed for ABA using the Sobek Testing Method. The analytical results are presented in Table 8-1, Appendix D-8.

The analytical results revealed a negative value for Net NP for four (EMR-WR1, EMR-WR2, EMR-WR4 and DUP-1) of the five rock samples analyzed, indicating that PAG waste rock was used in the construction of the East Mine Access Road. Although sample EM-WR3 had a positive net NP value, the NP/AP ratio was less than 4.0 and therefore should also be considered PAG, given a safety factor of 4.0 (Price, 1997).

8.5.1.4 ABA Results – Big Rambler Pond Access Road

Four roadway rock samples (BRP-WR3 to BRP-WR6) collected along the Big Rambler Pond Access Road were analyzed for ABA using the Sobek Testing Method. The analytical results are presented in Table 8-1, Appendix D-8.

The analytical results revealed a negative value for Net NP for all four rock samples analyzed, indicating that sulphide bearing waste rock was used in the construction of the Big Rambler Pond Access Road. The NP/AP ratio for all rock samples analyzed was less than 4.0 and therefore should be considered PAG, given a safety factor of 4.0 (Price, 1997).

8.5.1.5 ABA Results – Tailings Road

Four roadway rock samples (TAIL-WR1 to TAIL-WR4) collected along the access roads present along the perimeter of the tailing area were analyzed for ABA using the Sobek Testing Method. The analytical results are presented in Table 8-1, Appendix D-8.

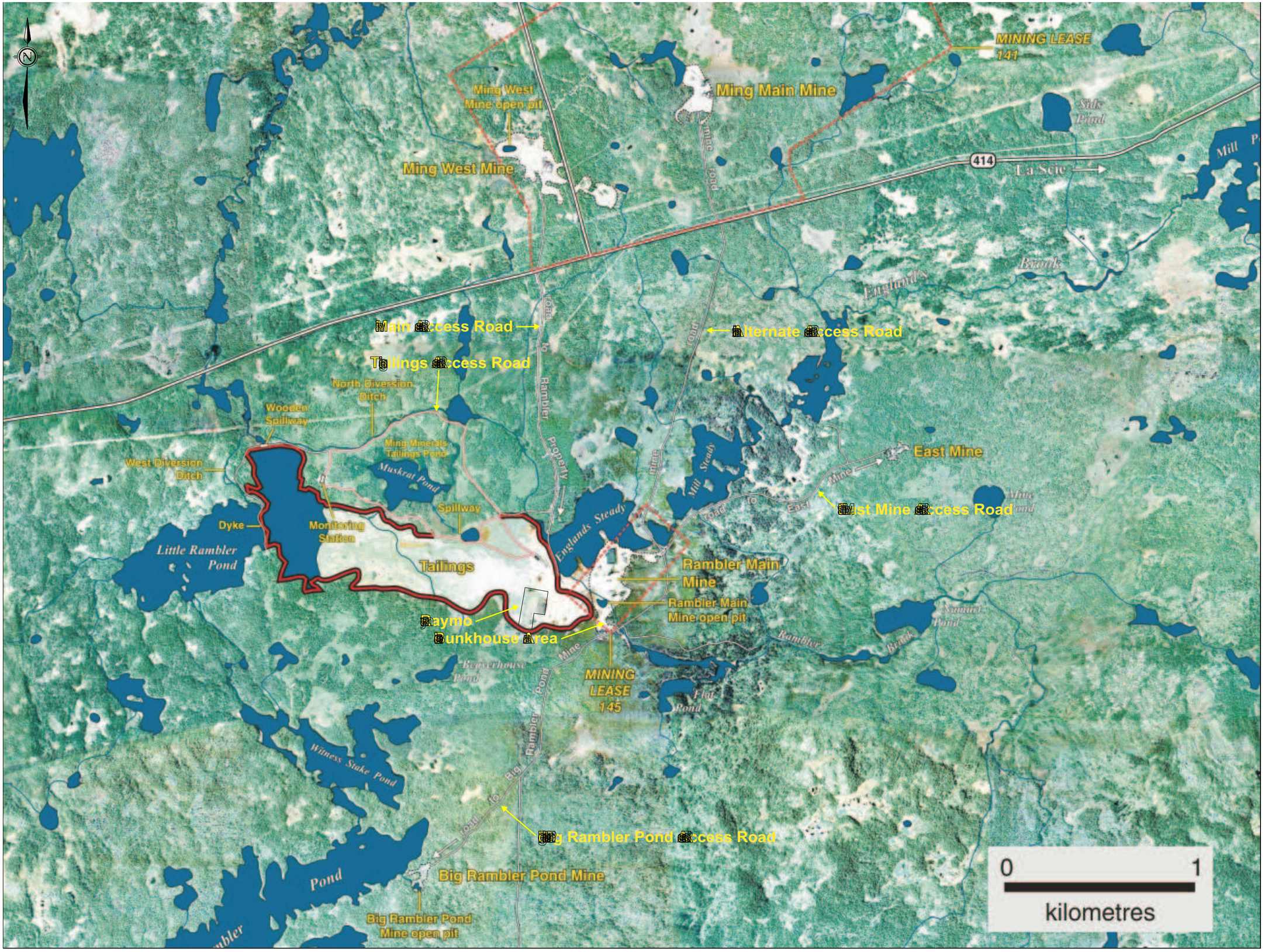
The analytical results revealed a negative value for Net NP for two (TAIL-W2 and TAIL-WR4) of the four waste rock samples analyzed, indicating that sulphide bearing waste rock was used in the construction of the roadways around the perimeter of the Tailings Area. Although sample TAIL-WR3 had a positive net NP value, the NP/AP ratio was less than 4.0 and therefore should also be considered PAG, given a safety factor of 4.0 (Price, 1997).

8.6 DISCUSSION

Based on the testing completed during the current investigation, it is evidence that PAG waste rock was used in the construction of the various roadways present throughout the Site. The PAG waste rock present at the Site was not buried at the time of the current investigation, but exposed the elements, air and water. Given these condition, waste rock present along the access roadways will likely continue to produce acid and therefore have an impact on the surrounding environment

APPENDIX A-8

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER CONSOLIDATED RAMBLER MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

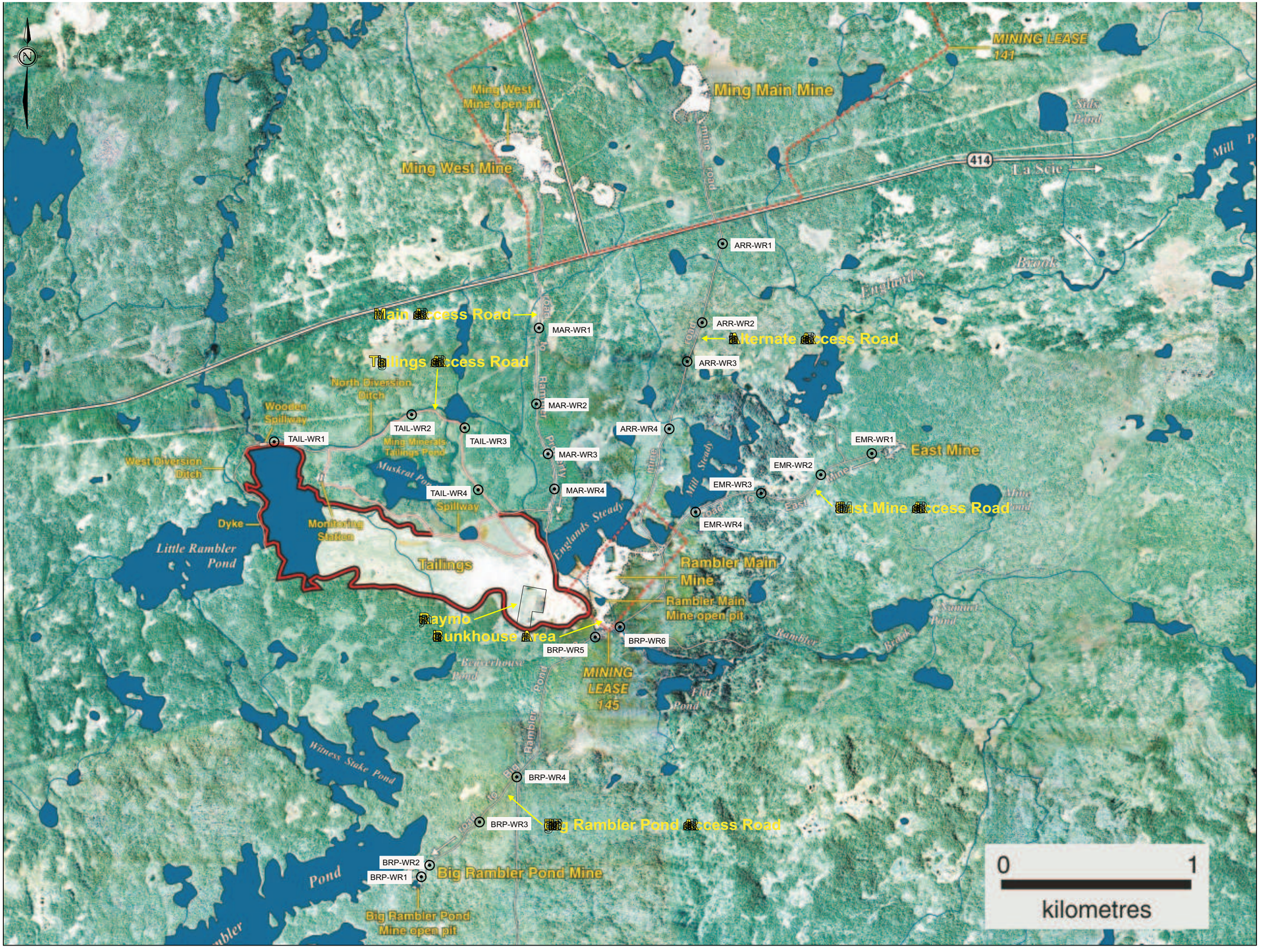
DRAWING TITLE

DETAILED SITE LOCATION PLAN

SCALE	PROJECT NUMBER
N.T.S.	TF 6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE No:	DATE	REV
8.1	January 2007	



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⊙ WASTE ROCK SAMPLE

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
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BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

ROADWAY SAMPLE LOCATIONS - WASTE ROCK

SCALE	PROJECT NUMBER
N.T.S.	TF 6126508

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

FIGURE No:	DATE	REV
8.2	January 2007	

APPENDIX B-8

PHOTOGRAPHIC RECORD

Photo 1: Main Access Road to the Rambler Mine.
(Note the Potential Acid Generating Waste Rock
and Stressed Vegetation)

Photo 2: Tailing Access Road.
(Note the Potential Acid Generating Waste Rock)

Photo 3: East Mine Road.
(Note the Potential Acid Generating Waste Rock)

Photo 4: Alternate Access Road.
(Note the Potential Acid Generating Waste Rock)

Photo 5: Stressed Vegetation
(Main Access Road).

Photo 6: Stressed Vegetation
(Tailings Road).

APPENDIX C-8

GPS COORDINATES

GPS COORDINATES - NAD27 - ACCESS ROADS

Location	Northing	Easting
MAR-WR1	565561	5528279
MAR-WR2	565607	5527782
MAR-WR3	565664	5527616
MAR-WR4	565629	5527411
AAR-WR1	566528	5528850
AAR-WR2	566450	5528557
AAR-WR3	566406	5528429
AAR-WR4	566247	5527889
TAIL-WR1	564132	5527820
TAIL-WR2	564738	5527868
TAIL-WR3	564972	5527999
TAIL-WR4	565170	5527873
EMR-WR1	567330	5527756
EMR-WR2	567094	5527678
EMR-WR3	566349	5527524
EMR-WR4	566424	5527476
BRP-WR3	565053	5525669
BRP-WR4	565053	5525669
BRP-WR5	565878	5526825
BRP-WR6	565878	55526825

APPENDIX D-8

LABORATORY ANALYSES TABLES

Table 8-1: Modified Acid-Base Accounting for Waste Rock - Access Roads

Lab ID	Sample ID	TOC	Paste pH	Total Sulphur	Sulfate	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
				%	%	%	Kg $CaC0_3$/tonne			
East Mine Road										
63743-02	EMR-WR1	0.05	7.4	1.210	0.030	1.180	37.8	15.7	-22.1	0.42
63743-03	EMR-WR2	0.08	4.7	7.500	0.120	7.380	234.0	-1.3	-236.0	-0.01
63743-24	DUP-1	<0.05	7.2	0.837	0.037	0.800	26.2	3.1	-23.0	0.12
63743-04	EMR-WR3	0.05	6.7	0.577	0.168	0.409	18.0	18.2	0.1	1.01
63743-05	EMR-WR4	<0.05	6.9	0.122	0.032	0.090	3.8	1.5	-2.3	0.39
Tailings Road										
63743-06	TAIL-WR1	<0.05	7.6	0.029	0.027	0.002	0.8	5.6	4.7	7.00
63743-07	TAIL-WR2	<0.05	7.1	1.220	0.091	1.129	38.1	25.5	-12.7	0.67
63743-08	TAIL-WR3	<0.05	8	0.670	0.030	0.640	20.9	62.4	41.4	2.99
63743-09	TAIL-WR4	<0.05	7.6	2.740	0.019	2.721	85.6	15.8	-69.9	0.18
Main Access Road										
63743-10	MAR-WR1	0.06	6.8	4.210	0.060	4.150	132.0	5.3	-126	0.04
63743-11	MAR-WR2	<0.05	7.1	0.232	0.057	0.175	7.3	25.0	17.8	3.42
63743-12	MAR-WR3	0.07	6.6	1.700	0.147	1.553	53.1	9.8	-43.3	0.18
63743-13	MAR-WR4	0.05	6.6	0.204	0.160	0.044	6.4	21.7	15.3	3.39
Alternate Access Road										
63743-14	AAR-WR1	<0.05	7.2	1.630	0.052	1.578	50.9	15.8	-35.1	0.31
63743-15	AAR-WR2	<0.05	7.2	1.370	0.065	1.305	42.8	7.4	-35.4	0.17
63743-16	AAR-WR3	<0.05	6.7	1.780	0.265	1.515	55.6	38.1	-17.5	0.69
63743-17	AAR-WR4	<0.05	6.8	0.074	0.041	0.033	2.3	1.8	-0.5	0.78
Big Rambler Pond Access Road										
63743-20	BRP-WR3	0.07	5.0	2.510	0.142	2.368	78.4	-0.3	-78.7	0.00
63743-21	BRP-WR4	<0.05	6.2	2.400	0.084	2.316	75.0	3.3	-71.7	0.04
63743-22	BRP-WR5	<0.05	6.0	0.407	0.198	0.209	12.7	-1.7	-14.4	-0.13
63743-23	BRP-WR6	0.05	6.7	0.763	0.122	0.641	23.8	19.8	-4.0	0.83

Notes:

TOC: Total Organic Carbon

The modified acid-base accounting was determined by the modified Sobek method

Percent Sulfide is calculated by subtracting the Percent Sulfate from Total Percent Sulphur

A negative value for Net Neutralizing Potential indicates that the material is a net acid producer

DUP-1 is a blind field duplicate of waste rock sample EMR-WR2

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9.0 QA/QC DISCUSSION

Approximately 10 percent of all samples submitted to the laboratory were blind field duplicates for each parameter of each media tested. A total of 14 field duplicate soil samples (DUP 1 to DUP 12, DUP B and DUP C), two field duplicate waste rock samples (DUP-1 and DUP-2), one field duplicate sediment sample (DUP A), one field duplicate groundwater sample (DUP E) and one field duplicate surface water sample (DUP D) were submitted to the laboratory during the field program for select chemical analyses. Laboratory blanks and laboratory replicate samples were also analyzed to assess the reliability of the analyses. The laboratory QA/QC results are reported on the Laboratory Certificates of Analysis included in Section 13.0. To assess the quality of both the sampling and laboratory analytical program, a review of the QA/QC results was completed.

Assessment of the analysis of the blind field duplicates, laboratory blanks and laboratory replicates showed relatively good correlation. Overall, based on this QA/QC review, the analytical results are considered representative of the Site conditions in the immediate vicinity of the sample locations.

9.1 SURROGATE RECOVERIES

Surrogate recoveries have been reviewed to evaluate the effectiveness and accuracy of the method on a sample-specific basis. It is noted that the acceptable range for surrogate recoveries for all organic parameters is 60 to 140% in all media. A summary of the reported surrogate recovery data for each media and parameter is provided in Table 9-1.

Table 9-1: Surrogate Recovery Summary

Media	Parameter	Surrogate Recovery			
Soil and Sediment	BTEX/TPH	DFB: 90-106%	4-B: 71-129%	TFT: 95-109%	OT: 64-131%
	PAHs	NP-8: 64-73%	AN-10: 83-121%	P-12: 73-128%	
	PCBs	DCB: 73-123%			
Concrete, Paint and Swab	PCBs	DCB: 94-109%			
Groundwater	BTEX/TPH	DFB: 96-100%	4-B: 100-103%	OT: 64-98%	

Notes:
Surrogate recoveries identified as follows:

DFB Difluorobenzene
4-B 4-Bromofluorobenzene
TFT Trifluorotoulene
OT O-Terphenyl
NP-8 Naphthalene-d8
AN-10 Antracene-d10
P-12 Perylene-d12
DCB Decachlorobiphenyl

For all soil, sediment, groundwater, concrete, paint and swab samples analyzed, all surrogate recoveries were within the acceptable range (60-140%).

9.2 LABORATORY BLANKS

Laboratory blanks were analyzed for all paint, asbestos, soil, concrete, swab sediment, surface water and groundwater parameters tested during the laboratory analytical program. The purpose of the laboratory blanks was to assess the quality of the laboratory results with respect to the presence/absence of instrument cross contamination at the laboratory.

Results of the laboratory analyses revealed that non-detectable of all tested parameters (refer to the Certificates of analyses in Section 13.0).

9.3 BLIND FIELD DUPLICATES

The results of the analyses of blind field duplicate samples were compared as relative percent differences (RPD), which are given by the difference in two results times 100 divided by the mean of the two results. These evaluations are only applicable when both results are at least three times the reporting limit. For groundwaters, wastewaters, surface waters and composite soil samples, RPD values of 50% or less are acceptable. For discrete soil or sediment samples, where there is no theoretical reason for the samples to be equivalent, RPDs of 100% or less are considered to be acceptable proof of equivalency.

For soil and sediment samples submitted in duplicate, all RPD results were acceptable (100% or less), with the following exceptions:

<u>Metals</u>
Selenium: 127% in EM-TP13-SS1 and DUP 10; and
Mercury: 150% in TAIL-SED7 and DUP A.

For groundwater and surface water samples submitted in duplicate, all RPD results were acceptable (50% or less), with the following exceptions:

<u>Metals</u>
Aluminum: 83% in TAIL-MW1 and DUP E;
Barium: 61% in TAIL-MW1 and DUP E;
Cadmium: 183% in TAIL-MW1 and DUP E;
Calcium 151% in TAIL-MW1 and DUP E;
Chromium: 67% in TAIL-MW1 and DUP E;
Copper: 200% in TAIL-MW1 and DUP E;
Magnesium: 145% in TAIL-MW1 and DUP E;
Manganese: 114% in TAIL-MW1 and DUP E;
Phosphorus: 180% in TAIL-MW1 and DUP E;
Potassium: 155% in TAIL-MW1 and DUP E;
Silver: 100% in TAIL-MW1 and DUP E;
Sodium: 129% in TAIL-MW1 and DUP E; and
Zinc: 144% in TAIL-MW1 and DUP E.

General Water Chemistry
Nitrate: 105% in TAIL-MW1 and DUP E; and
Total Suspended Solids: 152% in TAIL-MW1 and DUP E.
The variability noted in the analyses of the blind field duplicate samples will not change the overall interpretation of the Site data.

9.4 LABORATORY REPLICATES

The results of the analyses of laboratory replicate samples were also compared as RPD. For groundwaters, wastewaters, surface waters and composite soil samples, RPD values of 50% or less are acceptable. For soil, sediment, paint and concrete samples, where there is no theoretical reason for the samples to be equivalent, RPDs of 100% or less are considered to be acceptable proof of equivalency.

For soil, sediment, groundwater, paint and concrete samples analyzed in replicate, all RPD results were acceptable (100% or less).

For groundwater samples analyzed in replicate, all RPD results were acceptable (50% or less).

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APPENDICES

10.0 LIST OF PETROLEUM STORAGE TANKS

As indicated in the RFP for the Phase II ESA, one objective of the current investigation was to prepare a list of petroleum storage tanks present at the Site. Petroleum storage tanks identified at the Site at the time of the current investigation are present in this section. Please note that since the Site buildings present at Mining Lease 145 (Rambler Main Mine and Bunkhouse Area) remain the property of Ming Minerals Limited the interior of the Site buildings were not inspected during the current investigation. Therefore, it is possible that additional petroleum storage tanks may be housed within the Site buildings present at this area of the Site.

10.1 AREA A: RAYMO PROCESSING FACILITY

No petroleum storage tanks were identified at this area of the Site at the time of the current investigation.

10.2 AREA B: EAST MINE

No petroleum storage tanks were identified at this area of the Site at the time of the current investigation.

10.3 AREA C: BIG RAMBLER POND MINE

No petroleum storage tanks were identified at this area of the Site at the time of the current investigation.

10.4 AREA D: TAILINGS AREA

No petroleum storage tanks were identified at this area of the Site at the time of the current investigation.

10.5 AREA E: RAMBLER MAIN MINE (MINING LEASE 145)

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- Two 200-gallon ASTs and a diesel-powered generator were observed on the east side of the main mill building (refer to Photo 1, Appendix A-10);
- Fill and vents pipes of an UST were observed on the northside of the maintenance garage (refer to Photo 2, Appendix A-10);
- Two USTs (one gasoline and one diesel) were observed north of the refuelling station (refer to Photo 3, Appendix A-10);
- A discarded 200-gallon AST was observed east of the maintenance garage (refer to Photo 4, Appendix A-10); and

- A discarded 5,000-gallon tank (possible former UST) was observed approximately 15 m south of the maintenance garage (refer to Photo 5, Appendix A-10).

10.6 AREA F: BUNKHOUSE AREA (MINING LEASE 145)

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- A partially buried UST was observed at the southwest corner of Bunkhouse No.2 (refer to Photo 6, Appendix A-10); and
- A discarded UST was observed in the woods approximately 20 m south of the Staff House (refer to Photo 7, Appendix A-10).

APPENDIX A-10

PHOTOGRAPHIC RECORD

Photo 1: Two 200-Gallon ASTs - Main Mill Generator Room.
(Rambler Main Mine)

Photo 2: UST - Northside of Maintenance Garage.
(Rambler Main Mine)

Photo 3: Gasoline UST and Diesel UST – Refueling Station.
(Rambler Main Mine)

Photo 4: Discarded 200-Gallon AST – Rear of Maintenance Garage.
(Rambler Main Mine)

Photo 5: Possible Discarded UST - South of Maintenance Garage.
(Rambler Main Mine)

Photo 6: UST - Southwest Corner of Bunkhouse No. 2.
(Bunkhouse Area)

Photo 7: Discarded UST - Southwest of Staff House.
(Bunkhouse Area)

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11.0 CONCLUSIONS

Based on the findings of the Phase II ESA conducted at the Site by AMEC in September 2006, the following subsections present the conclusions made with respect to the environmental status of each area of subject property investigated.

11.1 AREA A: RAYMO PROCESSING FACILITY

11.1.1 Lead in Paint

Results of the paint sampling program revealed that the concentration of lead (18,400 mg/kg) detected in the blue painted surfaces (i.e. blue on green on red paint) of the processing equipment remaining at the Site exceeded both the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg and therefore considered to a health hazard during any renovation/demolition activities at the Site.

The concentration of lead leachate (0.641 mg/L) detected in the blue paint did not exceed the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is not at a level considered hazardous, this paint, if removed from the Site, may be disposed be of at an approved landfill facility.

11.1.2 Petroleum Hydrocarbons

The concentration of toluene (2.9 µg/L) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guideline of 2.0 µg/L, but did not exceed the applicable 2003 Atlantic PIRI Tier I RBSL of 20,000 µg/L.

11.1.3 Cyanide

Soil

Concentrations of total cyanide detected in soil samples RPF-TP3-SS1 (13.1 mg/kg), RPF-TP4-SS1 (12.3 mg/kg) and RPF-TP7-SS1 (12.2 mg/kg) exceeded the applicable CCME-CEQG of 8.0 mg/kg. Soil samples RPF-TP3-SS1 and RPF-TP4-SS1 were collected adjacent to the holding pond (i.e. vats) and soil sample RPF-TP7-SS1 was collected at the location of the former cyanide drum storage area.

Raymo Tailings

The concentration of total cyanide detected in soil sample RPF-TP9-SS1 (66.8 mg/kg), collected from the Raymo tailings pile, exceeded the applicable CCME-CEQG of 8.0 mg/kg.

Sediment of Holding Pond

The concentration of total cyanide detected in sediment sample RPF-SED1 (31.4 mg/kg), collected from the holding pond (i.e. vats) of the processing facility, exceeded the CCME-CEQG of 8.0 mg/kg for cyanide in soil at an industrial site. Therefore, in the event that the processing facility is to be decommissioned, special consideration must be given to treatment/disposal of the sediments within the holding pond.

11.1.4 pH and General Chemistry

Soil

Values of pH detected in soil samples RPF-TP5-SS3 (4.8) and RPF-TP8-SS3 (4.9) were less than the applicable CCME-CEQG of 6.0 to 8.0. This indicates that soils at the Site are acidic. Soil samples RPF-TP5-SS3 and RPF-TP8-SS3 were collected within the area of buried waste/debris present at the Site.

Sediment

The value of pH detected in sediment sample RPF-SED1 (5.3), collected from the holding pond (i.e. vats) of the processing facility, was less than 7.0, indicating acidic conditions.

Groundwater

The value of pH detected in groundwater sample RPF-MW1 (3.63) was less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater at the Site is acidic. As well, the concentration of fluoride (0.70 mg/L) detected in this groundwater sample exceeded the applicable CCME-FAL guideline of 0.12 mg/L.

Surface Water

The value of pH detected in surface water samples RPF-SW1 (2.66) and RPF-SW2 (3.16) were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Surface water sample RPF-SW1 was collected from the drainage ditch located north of the processing facility and surface water sample RPF-SW2 was collected from the holding pond (i.e. vats) of the processing facility. This indicates that surface waters within the drainage ditch and holding pond are acidic.

11.1.5 Metals

Soil

Concentrations of a combination of metals (i.e. arsenic, chromium, copper, nickel and selenium) detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

Sediment

Concentrations of metals (i.e. arsenic, cadmium, copper, lead, mercury and zinc) detected in sediment sample RPF-SED1 (31.4 mg/kg), collected from the holding pond (i.e. vats) of the processing facility, exceeded the CCME-ISQGs and PELs for freshwater sediment.

Groundwater

Concentrations of a combination of metals (i.e. aluminum, cadmium, chromium, copper, iron, nickel, selenium, silver and zinc) detected in groundwater sample RPF-MW1 exceeded the applicable CCME-FAL guidelines. Based on this data and other testing conducted on the other media at the Site, it is likely that metal impacts in groundwater are widespread throughout the Site.

Surface Water

Concentrations of metals detected in surface water samples RPF-SW1 (i.e. aluminum, arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, and zinc) and RPF-SW2 (aluminum,

cadmium, copper, iron, lead, nickel, silver and zinc) exceeded the applicable CCME-FAL guidelines. Surface water sample RPF-SW1 was collected from the drainage ditch located north of the processing facility and surface water sample RPF-SW2 was collected from the holding pond (i.e. vats) of the processing facility.

11.2 AREA B: EAST MINE

11.2.1 Asbestos Containing Materials

Asbestos was detected in the drywall compound and exterior siding (west side) of Building No.2. Asbestos fibres in drywall joint compound and siding are considered to be “non-friable”, unless disturbed.

11.2.2 Lead in Paint

Results of the paint sampling program revealed that the concentrations of lead detected in all paint samples, with the exception of paint samples EM-PS6 (red paint) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to a health hazard during any renovation/demolition activities at the Site.

The concentration of lead leachate (5.29 mg/L) in paint sample EM-PS7 (grey on green paint on the mechanical equipment inside Building No.2) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentration of lead leachate in this paint is at a level considered hazardous. In the absence of further consideration (i.e. dilute with substrate), this paint must be disposed of as a hazardous material.

11.2.3 PCBs

Swab

The concentration of PCBs detected in swab sample EM-SWAB (40.9 µg/100 cm^2) exceeded the U.S. EPA guideline of 10 ug/100 cm^2. Therefore, the metal pan must be treated as a hazardous material and cannot be sent to a metal recycling facility, but to an approved hazardous materials treatment facility. The detection of PCB in the swab sample confirms that PCB containing liquid (i.e. dielectric fluid) had been released onto the surfaces of the metal pan.

Concrete

Concentrations of PCBs in the three concrete samples EM-CONC 1 (12.9 mg/kg), EM-CONC 2 (27.1 mg/kg) and EM-CONC 3 (29.0 mg/kg) collected from the slab-on-grade floor of the PCB Storage Area of Building No. 2 were detected at levels below the applicable assessment criteria of 33 mg/kg for PCBs in soil at industrial sites. Based on the testing completed, the levels of PCBs detected in concrete floor of the former PCB Storage Area of Building No.2 are not considered to be a concern at this time.

Soil

Concentrations of PCBs in all 11 soil samples collected at the Site were either non-detect or detected at levels below the applicable assessment criterion of 33 mg/kg for PCBs in soil at industrial sites. Please note that the concentration of PCBs (6.21 mg/kg) detected in soil sample EM-TP16-SS1, collected at

the location of soil sample TP-1 (JWEL 2003) that revealed a PCB concentration of 133 mg/kg, did not exceed the applicable assessment criteria of 33 mg/kg for PCBs in soil at industrial sites. Therefore, based on the testing completed, PCB contaminated soil is not suspected to be a major issue at the Site at this time.

11.2.4 Metals

Concentrations of a combination of metals (i.e. arsenic, chromium, copper and selenium) detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

11.2.5 PAG Waste Rock

Based on the testing completed during the current investigation, it is evidence that PAG waste rock is present throughout the Site.

11.3 AREA C: BIG RAMBLER POND MINE

11.3.1 Metals

Sediment
Concentrations of metals (i.e. chromium, copper and lead) detected in sediments collected from Big Rambler Pond exceeded the applicable assessment criteria for metals for metals in freshwater sediment.

Surface Water
Concentrations of metals (i.e. aluminum, cadmium, chromium, copper and lead) detected in surface water collected from both the open pit and Big Rambler Pond exceeded the applicable FAL guidelines.

11.3.2 pH

Sediment
Analysis of the sediment sample collected from Big Rambler Pond revealed acidic conditions with a pH value of 4.6.

Surface Water
Values of pH detected in surface water collected from both the open pit (5.67) and Big Rambler Pond (5.63) were lower than the applicable FAL guideline of 6.5 to 9.0, indicating acidic water conditions.

11.3.3 PAG Waste Rock

The ABA analyses indicated that the waste rock present at the Site is PAG. The waste rock present at the Site was not buried at the time of the current investigation, but exposed the elements, air and water. Given these condition, waste rock present at the Site will likely continue to produce acid and therefore have an impact the surrounding environment.

11.4 AREA D: TAILINGS AREA

11.4.1 Metals

Concentrations of a combination of metals detected in all six groundwater, fourteen surface water, eight sediment and four tailings samples collected at the Site during the current investigation exceeded the applicable assessment guidelines. Based on the testing completed, metal impacts detected in all media sampled are considered to be widespread throughout the Site.

11.4.2 Cyanide

Groundwater
The concentration of total cyanide (0.018 mg/L) detected one (MW4) of the six groundwater samples collected at the Site during the current investigation exceeded the applicable assessment criterion of 0.005 mg/L. Groundwater sample MW4 was collected from a standpipe located near the Spillway (refer to Figure 5.2, Appendix A-5).

Surface Water, Sediment and Tailings
Concentrations of cyanide detected in all surface water, sediment and tailings samples collected at the Site during the current investigation were either non-detect or detected at levels below the applicable assessment criteria. Therefore, based on the testing completed, cyanide impacts at this area of the Site are limited to groundwater.

11.4.3 pH

Groundwater
Values of pH (2.75 to 5.77) detected in four (TAIL-MW1, TAIL-MW2, MW3, MW4) of the six groundwater samples collected at the Site during the current investigation were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater present throughout the majority of the Site is acidic.

Sediment
Values of pH detected in all eight freshwater sediment samples analyzed were reported less than 7.0, which indicate acidic sediment conditions throughout the Site. Values of pH detected in sediment ranged from 4.2 (LRP-SED1) to 6.5 (TAIL-SED1). This indicates that sediment present within the various freshwater bodies, tailing ponds and drainage ditches present throughout the Site are acidic.

Surface Water
Values of pH detected in all 14 surface water samples collected at the Site were less than the applicable CCME-FAL guideline of 6.5 to 9.0. Values of pH detected in surface water samples analyzed ranged from 2.54 (TAIL-SW3) to 5.71 (LRP-SW1). The lowest values of pH were detected in the Tailings Pond (2.54 to 2.55) and downgradient of the Spillway (2.71). The highest values of pH were detected in Little Rambler Pond (5.63 to 5.71) and downgradient of the Wooden Spillway (5.56). This indicates that surface water present throughout the Site is acidic.

It is important to note that the value of pH (4.35) detected in surface water leaving the property (i.e. South Brook near Route 414) was well below the CCME-FAL guideline of 6.0 to 8.0. This indicates off-Site migration of acidic waters from the Site into the aquatic environmental of South Brook and possibility other downgradient freshwater and marine habitats.

Tailings

Values of pH detected in all four tailings samples analyzed were less than the applicable CCME-CEQG of 6.0 to 8.0. Values of pH detected in the tailings samples analyzed ranged from 2.2 (TAIL-TL3) to 2.5 (TAIL-TL1). The ABA analyses also indicated that the tailings present at the Site are PAG. The majority of the tailings present at the Site was not buried or covered with water, but exposed the elements, air and water. Given these condition, tailings present at the Site will likely continue to produce acid and therefore have an impact on the surrounding and downgradient (off-Site) aquatic environments.

11.5 AREA E: RAMBLER MAIN MINE (MINING LEASE 145)

11.5.1 Petroleum Hydrocarbons

The concentration of modified TPH detected in soil sample RMM-TP5-SS1 (<12,200 mg/kg), collected adjacent to and downgradient of the generator and two 910 L ASTs present on the east side of the Main Mill Building exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater (refer to Figure 6.2, Appendix A-6).

Even though there are no applicable criteria available for the assessment of TPH in freshwater sediment, it is important to note that the concentration of TPH (1,340 mg/kg) detected in sediment sample RMM-SED2, collected form the drainage ditch located directly east and downgradient of the Maintenance Garage present at the Site, is considered to be significant (refer to Figure 6.2, Appendix A-6).

11.5.2 Metals

Concentrations of a combination of metals detected in all soil, groundwater and sediment samples collected at the Site during the current investigation exceeded the applicable assessment guidelines. Based on the testing completed, metal impacts detected in all media sampled are considered to be widespread throughout the Site.

11.5.3 Cyanide

Soil

The concentration of total cyanide (21.0 mg/kg) detected in one soil sample (RMM-TP3-SS2) collected at the Site during the current investigation exceeded the applicable CCME-CEQG of 8.0 mg/kg. Soil sample RMM-TP3-SS2 was collected along the west side of the Main Mill Building (refer to Figure 6.2, Appendix A-6).

Groundwater

The concentration of total cyanide (0.146 mg/L) detected in one (RMM-MW1) of the six groundwater samples collected at the Site during the current investigation exceeded the applicable assessment criterion of 0.005 mg/L. Groundwater sample RMM-MW1 was collected on the northwest corner of the Main Mill Building (refer to Figure 6.2, Appendix A-6).

11.5.3 pH and General Chemistry

Groundwater

Values of pH (2.06 to 6.01) detected in all six groundwater samples collected at the Site during the current investigation were less than the applicable CCME-FAL guideline of 6.5 to 9.0. This indicates that groundwater throughout the Site is acidic.

Concentrations of fluoride detected in groundwater samples RMM-MW2 (1.2 mg/L), RMM-MW3 (1.5 mg/L) and RMM-MW5 (0.3 mg/L) exceeded the applicable CCME-FAL guideline of 0.12 mg/L and the concentrations of phenols detected in groundwater samples RMM-MW1 (0.006 mg/L) and RMM-MW5 (0.005 mg/L) also exceeded the applicable CCME-FAL guideline of 0.004 mg/L.

11.6 AREA F: BUNKHOUSE AREA (MINING LEASE 145)

11.6.1 Petroleum Hydrocarbons

Concentrations petroleum hydrocarbons detected in soil at all locations tested were either non-detect or detected at levels below the applicable assessment criteria.

11.6.2 Lead

Concentrations lead detected in soil at all locations tested were either non-detect or detected at levels below the applicable assessment criteria.

11.6.3 PCBs

PCBs were not-detected in any of the soil sample collected from underneath the two pole-mounted transformers identified at the site and therefore below the applicable assessment criteria.

11.7 AREA G: ACCESS ROADWAYS

Based on the testing completed during the current investigation, it is evidence that PAG waste rock was used in the construction of the various roadways present throughout the Site. The PAG waste rock present at the Site was not buried at the time of the current investigation, but exposed the elements, air and water. Given these condition, waste rock present along the access roadways will likely continue to produce acid and therefore have an impact on the surrounding environment

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12.0 RECOMMENDATIONS

Based on the findings of the Phase II ESA, AMEC recommends that the following Phase III ESA requirements for the Site at this time.

12.1 AREA A: RAYMO PROCESSING FACILITY

- Re-sample monitoring well RPF-MW1 and install two additional monitoring wells to delineate the toluene impacts identified in groundwater in the vicinity of monitoring well RPF-MW1; and
- Excavate six additional test pits at the former cyanide drum storage area to delineate the vertical and horizontal extent of cyanide impacted in soil at this area of the Site.

12.2 AREA E: RAMBLER MAIN MINE (MINING LEASE 145)

- Excavate four additional test pits to delineate the vertical and horizontal extent of TPH contaminated soil identified adjacent to the generator and two 910 L ASTs present on the east side of the mill building;
- Excavate four additional test pits to delineate the vertical and horizontal extent of cyanide contaminated soil identified along the west side of the mill building;
- Install three additional boreholes/monitoring wells at the Site to delineate the extent of cyanide impacted groundwater identified in the vicinity of monitoring well RMM-MW1;
- In the event that ownership of the Site buildings is transferred to the Province of Newfoundland and Labrador, a Hazardous Materials Assessment (HMA) should be implemented at the Site to identify any additional environmental concerns and hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required). In the meantime, special consideration should be given to securing or proper removal and disposal of all chemicals being stored within the PCB and Reagent Storage Area of the mill building and the chemical laboratory present at the Site;
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
- In the event that the pad-mounted and pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

12.3 AREA F: BUNKHOUSE AREA (MINING LEASE 145)

- Install a minimum of three boreholes/monitoring wells to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;

- The UST identified on the southwest corner of Bunkhouse No.2 and the discarded UST identified in the woods approximately 20 m south of the Staff House should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations;
- In the event that ownership of the Site buildings is transferred to the Province of Newfoundland and Labrador, a HMA should be implemented at the Site to identify any additional environmental concerns and hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required); and
- In the event that the pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

Based on the findings of the Phase II ESA, AMEC does not recommend that any Phase III ESA activities for the East Mine, Tailings Area, Big Rambler Pond Mine and the Access Roads at this time. However, please note that additional environmental sampling and/or monitoring requirements, for all areas of the Site, may be required in the event that any future development and/or decommissioning activities are planned for the Site.

SECTION 13.0

Laboratory Certificates of Analyses

AMEC Earth & Environmental
133 Crosbie Rd.,PO.Box #13216
St.John's NL.
A1B 4A5
Attn.: Gary Warren

Date: September 21,2006
File#: JB06-169
W.O.#: TF6126508
Project: Rambler
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES % Chrysotile	Amosite	Other Asbestos Fibres	NON-ASBESTOS FIBRES % Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	% Nonfibrous Material
2006B-0883 2 Layer	EM-ASB1	Insulation	—	—	—	3	60	—	35	2
2006B-0884 2 Layer	EM-ASB2	DWC	10	—	—	65	—	—	3	22
2006B-0885 Homogeneous	EM-ASB3	Siding	25	—	—	3	—	—	2	70

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Attn.: Gary Warren

Date: September 21,2006
File#: JB06-169
W.O.#: TF6126508
Project: Rambler
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos.

Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no reponsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst _____

Authorized Signature _____

AMEC Earth & Environmental,
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 10, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Paint
Project Number:	TF 6126508	Lab Ref.:	F2006-1512
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Lead

Parameter Method Detection Limit Unit			Total Lead 5 (µg/g)	Total Mecury 0.01 (µg/g)
Lab Number	Sample ID	Date Collected		
S2006-10987	RPF-PS1	06-Sep-06	18400	0.096
S2006-10988	RPF-PS2	06-Sep-06	92.2	0.011
S2006-10989	TAIL-PS1	12-Sep-06	13.2	0.021
S2006-10990	EM-PS1	09-Sep-06	751	0.284
S2006-10991	EM-PS2	09-Sep-06	4890	0.552
S2006-10992	EM-PS3	09-Sep-06	7290	0.018
S2006-10993	EM-PS4	09-Sep-06	6050	0.018
S2006-10994	EM-PS5	09-Sep-06	1130	0.024
S2006-10995	EM-PS6	09-Sep-06	558	0.018
S2006-10996	EM-PS7	09-Sep-06	10900 (9960)	0.029 (0.021)
Lab Blank			<5	<0.01
Q.C. Standard Actual (mg/L)			1.00	0.002
Q.C. Standard Expected (mg/L)			1.00	0.002
Date of Analysis			26-Sep-06	22-Sep-06

Comment: Value in (brackets) signifies Lab Replicate

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

/gb

ASSOCIATION OF THE CHEMICAL PROFESSION ONTARIO CHARTERED CHEMIST Suman Punani

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 10, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Paint/Concrete
Project Number:	TF 6126508	Lab. Ref.:	F2006-1512
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10987	RPF - PS1	06-Sep-06	16.6	109
S2006-10990	EM - PS1	09-Sep-06	71.2	129
S2006-10998	EM-CONC 1	09-Sep-06	12.9	94
S2006-10999	EM-CONC 2	09-Sep-06	27.1	109
S2006-11000	EM-CONC 3	09-Sep-06	29.0 (28.5)	118 (120)
Lab Blank			<0.005	87
Blank Spike			0.077	102
Blank Spike Recovery (%)			96	91
Date of Analysis			02-Oct-06	02-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) signifies Lab Replicate

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

Analyst: S. Lam, C. Chem.
/gb

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Client:	AMEC Earth and Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	October 24, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126508	Lab. Ref.:	F2006-1512
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Lead)

Lab Number			S2006-10987	S2006-10992	S2006-10993	S2006-10996
Sample ID			RPF-PS1	EM-PS3	EM-PS4	EM-PS7
Date Collected			06-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06
Unit			(mg/L)	(mg/L)	(mg/L)	(mg/L)
Parameter	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	0.641	2.51	0.488	5.29

			Lab Blank	Q.C. Standard Found	Q.C. Standard Expected	Date of Analysis
Parameter	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	<0.002	1.04	1.00	19-Oct-06

Comments * Method Detection Limit

The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."

Lead - SM 3120 (ICP)

Analysis requested on October 16, 2006

Cynthia Ridge, C. Chem.
Q.A/Q.C Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	October 24, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126508	Lab. Ref.:	F2006-1512
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558- TCLP Leachate (PCB)

Lab Number Sample ID Date Collected Date of Analysis Unit			S2006-10990 EM-PS1 09-Sep-06 18-Oct-06 (mg/L)	Lab Blank (mg/L)	Leachate Blank (mg/L)	Blank Spike (mg/L)	Blank Spike Recovery (%)
Parameter	**Schedule 4 Leachate Criteria (mg/L)**	**MDL* (mg/L)**					
PCB	0.3	0.002	0.007	<0.002	<0.002	0.0008	102
Surrogate Recovery							
Decachlorobiphenyl (%)			85	83	93	93	93

Comments: * Method Detection Limit
Method: EPA 608 - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Analysis requested on October 16, 2006

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 10, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Swab
Project Number:	TF 6126508	Lab. Ref.:	F2006-1512
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.08 (ug/swab)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10997	EM- SWAB	09-Sep-06	40.9	118
Lab Blank			<0.008	87
Blank Spike			0.077	91
Blank Spike Recovery (%)			96	102
Date of Analysis			02-Oct-06	02-Oct-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

Analyst: S. Lam, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	1 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10613 RMM TP17-SS3 08-Sep-06 (ug/g)	S2006-10613 RMM TP17-SS3 08-Sep-06 (ug/g)	S2006-10614 RMM TP18-SS2 08-Sep-06 (ug/g)	S2006-10615 RMM TP19-SS1 08-Sep-06 (ug/g)	S2006-10616 RMM TP20-SS4 08-Sep-06 (ug/g)	S2006-10617 RMM TP22-SS3 08-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.05	0.05	0.07	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**0.05**	**0.05**	**0.07**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	11	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	11	<10	<10	<10	<10
TPH (>C10-C21)	10	<10	<10	<10	1080	<10	238
TPH (>C21-<C32)	50	51	<50	188	4940	<50	93
Modified TPH (Tier 1)**		<71	<70	<208	<6030	<70	<341
Hydrocarbon Identification		Chromatogram shows trace of heavy oil	-	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles weathered diesel
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		97	103	102	100	90	99
4-Bromofluorobenzene (%)		107	118	89	103	84	100
Trifluorotoluene (%)		104	104	106	99	103	104
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		92	86	96	113	85	127

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	2 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10618 RMM TP22-SS1 08-Sep-06 (ug/g)	S2006-10619 RMM TP23-SS3 08-Sep-06 (ug/g)	S2006-10620 RMM TP24-SS3 08-Sep-06 (ug/g)	S2006-10621 RMM TP25-SS1 08-Sep-06 (ug/g)	S2006-10622 RMM TP26-SS1 08-Sep-06 (ug/g)	S2006-10623 RMM TP27-SS1 08-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	0.28	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	4.25	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	2.47	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**7.05**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	42	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	34	<10	<10	<10	<10
TPH (>C10-C21)	10	23	987	2700	<10	28	15
TPH (>C21-<C32)	50	150	3890	1400	<50	200	70
Modified TPH (Tier 1)**		<183	4910	<4110	<70	<238	<95
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		100	101	99	99	104	103
4-Bromofluorobenzene (%)		129	114	98	116	109	98
Trifluorotoluene (%)		100	99	97	95	96	97
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		74	114	129	101	87	78

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		Page:	3 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10623 RMM TP27-SS1 08-Sep-06 (ug/g)	S2006-10624 RMM TP28-SS2 08-Sep-06 (ug/g)	S2006-10625 RMM TP29-SS4 08-Sep-06 (ug/g)	S2006-10626 DUP 6 08-Sep-06 (ug/g)	S2006-10628 RMM MW6-SS3 08-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**	**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	0.57
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**0.57**
TPH (C6-C10)	10	<10	<10	<10	<10	83
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	83
TPH (>C10-C21)	10	18	<10	2670	2610	1700
TPH (>C21-<C32)	50	86	<50	513	1490	122
Modified TPH (Tier 1)**		<106	<70	<3190	<4110	1910
Hydrocarbon Identification		Chromatogram resembles heavy oil	-	Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel
BTEX, TPH (C6-C10)						
Surrogate Recovery						
Difluorobenzene (%)		99	101	100	102	101
4-Bromofluorobenzene (%)		104	119	95	115	96
Trifluorotoluene (%)		96	98	99	99	109
TPH (>C10-<C32)						
Surrogate Recovery						
O-Terphenyl (%)		87	98	130	111	118

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		Page:	4 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Unit		Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Benzene	0.01	<0.01	2.40	96	14-Sep-06
Toluene	0.01	<0.01	2.35	94	14-Sep-06
Ethylbenzene	0.02	<0.02	2.30	92	14-Sep-06
m+p-Xylene	0.04	<0.04	2.27	91	14-Sep-06
o-Xylene	0.02	<0.02	2.24	89	14-Sep-06
TOTAL BTEX	**0.10**	**<0.10**	**11.6**	**92**	14-Sep-06
TPH (C6-C10)	10	<10	82.1	82	14-Sep-06
TPH (C6-C10) less BTEX	10	<10	70.5	87	14-Sep-06
TPH (>C10-C21)	10	<10	816	82	15/16-Sep-06
TPH (>C21-<C32)	50	<50			15/16-Sep-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification		-	-	-	-
BTEX, TPH (C6-C10)					
Surrogate Recovery					
Difluorobenzene (%)		97	99	99	14-Sep-06
4-Bromofluorobenzene (%)		91	104	104	14-Sep-06
Trifluorotoluene (%)		101	101	101	14-Sep-06
TPH (>C10-<C32)					
Surrogate Recovery					
O-Terphenyl (%)		93	121	121	15/16-Sep-06

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		Page:	5 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Comments:

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable

Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID

Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppm (ug/g)

Results reported on dry weight basis

Analysts: M. Mak, C. Chem.
M. Cojocar, B.Sc.

Cynthia Ridge, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	1 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10630 EM-TP1-SS1 09-Sep-06 (ug/g)	S2006-10631 EM-TP3-SS1 09-Sep-06 (ug/g)	S2006-10631 EM-TP3-SS1 09-Sep-06 (ug/g)	S2006-10634 EM-TP6-SS1 09-Sep-06 (ug/g)	S2006-10636 EM-TP8-SS1 09-Sep-06 (ug/g)	S2006-10637 EM-TP9-SS1 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	<100 ***	115	73	66	54	<10
TPH (>C21-<C32)	50	1540	1730	1170	900	293	<50
Modified TPH (Tier 1)**		<1650	<1860	<1250	<976	<357	<70
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	-
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		97	105	100	98	99	100
4-Bromofluorobenzene (%)		98	90	91	79	77	103
Trifluorotoluene (%)		101	96	95	97	100	101
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		121	92	66	97	87	67

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		Page:	2 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10638 EM-TP10-SS4 09-Sep-06 (ug/g)	S2006-10639 EM-TP11-SS1 09-Sep-06 (ug/g)	S2006-10640 EM-TP12-SS1 09-Sep-06 (ug/g)	S2006-10641 EM-TP13-SS1 09-Sep-06 (ug/g)	S2006-10642 EM-TP14-SS1 09-Sep-06 (ug/g)	S2006-10643 EM-TP15-SS1 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	<10	31	129	69	<10	793
TPH (>C21-<C32)	50	<50	160	761	<50	<50	3320
Modified TPH (Tier 1)**		<70	<201	<900	<129	<70	<4120
Hydrocarbon Identification		-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles weathered diesel	-	Chromatogram resembles diesel and heavy oil
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		97	104	99	99	97	101
4-Bromofluorobenzene (%)		116	93	107	112	92	85
Trifluorotoluene (%)		103	97	107	101	98	100
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		94	92	92	101	83	95

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		Page:	3 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10643 EM-TP15-SS1 09-Sep-06 (ug/g)	S2006-10645 RMM-TP30-SS1 09-Sep-06 (ug/g)	S2006-10646 RMM-TP31-SS1 09-Sep-06 (ug/g)	S2006-10647 RMM-TP32-SS1 09-Sep-06 (ug/g)	S2006-10648 RMM-TP33-SS1 09-Sep-06 (ug/g)	S2006-10649 RMM-TP34-SS1 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**	**(Replicate)**					
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	712	33	94	985	1450	53
TPH (>C21-<C32)	50	2920	335	437	591	1060	392
Modified TPH (Tier 1)**		<3640	<378	<541	<1590	<2520	<455
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		103	101	105	101	103	98
4-Bromofluorobenzene (%)		94	98	116	116	113	110
Trifluorotoluene (%)		96	99	100	99	98	102
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		74	86	107	115	113	96

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	4 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10650 DUP 7 09-Sep-06 (ug/g)	S2006-10651 DUP 8 09-Sep-06 (ug/g)	S2006-10651 DUP 8 09-Sep-06 (ug/g)	S2006-10654 RMM SED1 09-Sep-06 (ug/g)	S2006-10655 RMM SED2 09-Sep-06 (ug/g)	S2006-10656 RMM SED3 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	1340	161	N/R	10	186	<10
TPH (>C21-<C32)	50	685	3150	N/R	130	1140	181
Modified TPH (Tier 1)**		<2040	<3320	-	<150	<1340	<201
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		96	101	99	98	100	102
4-Bromofluorobenzene (%)		109	119	112	90	79	84
Trifluorotoluene (%)		98	96	100	98	101	100
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		128	131	N/R	80	91	68

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	5 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Parameters	MDL* (µg/g)	Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Benzene	0.01	<0.01	2.45	98	16-Sep-06
Toluene	0.01	<0.01	2.43	97	16-Sep-06
Ethylbenzene	0.02	<0.02	2.38	95	16-Sep-06
m+p-Xylene	0.04	<0.04	2.34	94	16-Sep-06
o-Xylene	0.02	<0.02	2.26	90	16-Sep-06
TOTAL BTEX	**0.10**	**<0.10**	**11.9**	**95**	16-Sep-06
TPH (C6-C10)	10	<10	73.9	111	16-Sep-06
TPH (C6-C10) less BTEX	10	<10	62.0	71	16-Sep-06
TPH (>C10-C21)	10	<10	813	81	15/18-Sep-06
TPH (>C21-<C32)	50	<50			15/18-Sep-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification		-	-	-	-
BTEX, TPH (C6-C10)					
Surrogate Recovery					
Difluorobenzene (%)		98	103	103	16-Sep-06
4-Bromofluorobenzene (%)		97	115	115	16-Sep-06
Trifluorotoluene (%)		101	98	98	16-Sep-06
TPH (>C10-<C32)					
Surrogate Recovery					
O-Terphenyl (%)		99	112	112	15/18-Sep-06

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		Page:	6 of 6
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Comments:

*	Method Detection Limit
**	Modified TPH is the total of TPH Purgeable and Extractable
	Total hydrocarbons quantified as Toluene/Diesel
	Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
	Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
	Values in ppm (ug/g)
	Results reported on dry weight basis
***	Higher MDL reported due to sample dilution factor
N/R	No Lab Replicate

Analysts: M. Mak, C. Chem.
M. Cojocar, B.Sc.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 03, 2006
		Page:	1 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10889 BH-TP1-SS2 11-Sep-06 (ug/g)	S2006-10890 BH-TP2-SS1 11-Sep-06 (ug/g)	S2006-10890 BH-TP2-SS1 11-Sep-06 (ug/g)	S2006-10891 BH-TP3-SS1 11-Sep-06 (ug/g)	S2006-10892 BH-TP4-SS1 11-Sep-06 (ug/g)	S2006-10893 BH-TP5-SS2 11-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**0.03**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	420
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	420
TPH (>C10-C21)	10	<10 (<10)	22	N/R	<10	<10	2650
TPH (>C21-<C32)	50	<50 (<50)	<50	N/R	<50	<50	<50
Modified TPH (Tier 1)**		<70	<82	-	<70	<70	<3120
Hydrocarbon Identification		-	Chromatogram resembles weathered diesel	-	-	-	Chromatogram resembles diesel
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		98	98	103	103	105	97
4-Bromofluorobenzene (%)		102	73	73	104	110	97
Trifluorotoluene (%)		101	99	99	98	99	113
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		91 (85)	93	N/R	81	80	100

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		Page:	2 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10894 BH-TP6-SS1 11-Sep-06 (ug/g)	S2006-10895 BH-TP7-SS1 11-Sep-06 (ug/g)	S2006-10896 BH-TP8-SS1 11-Sep-06 (ug/g)	S2006-10897 BH-TP9-SS2 11-Sep-06 (ug/g)	S2006-10898 BH-TP10-SS2 11-Sep-06 (ug/g)	S2006-10900 BH-TP12-SS1 11-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	669	<10	<10	<10	25	<10
TPH (>C21-<C32)	50	<50	<50	<50	<50	<50	<50
Modified TPH (Tier 1)**		<729	<70	<70	<70	<85	<70
Hydrocarbon Identification		Chromatogram resembles diesel	-	-	-	Chromatogram resembles weathered diesel	-
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		109	105	106	104	103	101
4-Bromofluorobenzene (%)		87	84	101	93	95	79
Trifluorotoluene (%)		105	101	104	97	100	99
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		114	78	88	79	84	78

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		Page:	3 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		SZ006-10903 Dup B 11-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**	
Benzene	0.01	<0.01
Toluene	0.01	<0.01
Ethylbenzene	0.02	<0.02
m+p-Xylene	0.04	<0.04
o-Xylene	0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**
TPH (C6-C10)	10	282
TPH (C6-C10) less BTEX	10	282
TPH (>C10-C21)	10	2610
TPH (>C21-<C32)	50	<50
Modified TPH (Tier 1)**		<2940
Hydrocarbon Identification		Chromatogram resembles diesel
BTEX, TPH (C6-C10)		
Surrogate Recovery		
Difluorobenzene (%)		94
4-Bromofluorobenzene (%)		71
Trifluorotoluene (%)		110
TPH (>C10-<C32)		
Surrogate Recovery		
O-Terphenyl (%)		114

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Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

		Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Benzene	0.01	<0.01	2.99	120	21-Sep-06
Toluene	0.01	<0.01	2.95	118	21-Sep-06
Ethylbenzene	0.02	<0.02	2.93	117	21-Sep-06
m+p-Xylene	0.04	<0.04	2.97	119	21-Sep-06
o-Xylene	0.02	<0.02	2.91	116	21-Sep-06
TOTAL BTEX	**0.10**	**<0.10**	**14.7**	**118**	21-Sep-06
TPH (C6-C10)	10	<10	79.1	79	21-Sep-06
TPH (C6-C10) less BTEX	10	<10	64.4	99	21-Sep-06
TPH (>C10-C21)	10	<10	812	81	25/27-Sep-06
TPH (>C21-<C32)	50	<50			25/27-Sep-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification		-	-	-	-
BTEX, TPH (C6-C10)					
Surrogate Recovery					
Difluorobenzene (%)		100	98	98	21-Sep-06
4-Bromofluorobenzene (%)		110	108	108	21-Sep-06
Trifluorotoluene (%)		102	99	99	21-Sep-06
TPH (>C10-<C32)					
Surrogate Recovery					
O-Terphenyl (%)		65	80	80	25/27-Sep-06

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		Page:	5 of 5
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Comments:

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable
Total hydrocarbons quantified as Toluene/Diesel
Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
Values in ppm (ug/g)
Results reported on dry weight basis

N/R No Lab Replicate

Analysts: M. Mak, C. Chem.
M. Cojocar, B.Sc.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	1 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10596 RMM-TP3-SS2 07-Sep-06 (ug/g)	S2006-10596 RMM-TP3-SS2 07-Sep-06 (ug/g)	S2006-10597 RMM-TP4-SS1 07-Sep-06 (ug/g)	S2006-10598 RMM-TP5-SS1 06-Sep-06 (ug/g)	S2006-10599 RMM-TP6-SS1 06-Sep-06 (ug/g)	S2006-10600 RMM-TP7-SS2 06-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**0.02**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	16
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	16
TPH (>C10-C21)	10	<10	<10	25	992	<10	183
TPH (>C21-<C32)	50	<50	<50	<50	11200	597	<50
Modified TPH (Tier 1)**		<70	<70	<85	<12200	<617	<249
Hydrocarbon Identification		-	-	Chromatogram resembles weathered diesel	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		101	102	102	101	101	100
4-Bromofluorobenzene (%)		91	104	105	84	88	92
Trifluorotoluene (%)		103	102	102	102	101	104
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		95	94	82	104	91	86

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		Page:	2 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10603 RMM-TP10-SS1 07-Sep-06 (ug/g)	S2006-10604 RMM-TP11-SS2 07-Sep-06 (ug/g)	S2006-10605 RMM-TP12-SS1 07-Sep-06 (ug/g)	S2006-10606 RMM-TP13-SS2 07-Sep-06 (ug/g)	S2006-10607 RMM-TP14-SS1 07-Sep-06 (ug/g)	S2006-10608 RMM-TP15-SS1 07-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	21
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	21
TPH (>C10-C21)	10	<10	<10	3340	<10	296	294
TPH (>C21-<C32)	50	110	<50	632	<50	502	462
Modified TPH (Tier 1)**		<130	<70	<3980	<70	<808	777
Hydrocarbon Identification		Chromatogram resembles heavy oil	-	Chromatogram resembles heavy oil	-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		100	100	100	101	100	98
4-Bromofluorobenzene (%)		47	87	87	72	90	82
Trifluorotoluene (%)		98	108	106	88	106	99
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		80	86	117	74	94	87

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	3 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10609 RMM-TP16-SS1 07-Sep-06 (ug/g)	Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**					
Benzene	0.01	<0.01	<0.01	2.01	81	14-Sep-06
Toluene	0.01	<0.01	<0.01	2.05	82	14-Sep-06
Ethylbenzene	0.02	<0.02	<0.02	2.10	84	14-Sep-06
m+p-Xylene	0.04	<0.04	<0.04	2.02	81	14-Sep-06
o-Xylene	0.02	<0.02	<0.02	2.01	80	14-Sep-06
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**10.2**	**82**	14-Sep-06
TPH (C6-C10)	10	<10	<10	75.2	75	14-Sep-06
TPH (C6-C10) less BTEX	10	<10	<10	65.0	78	14-Sep-06
TPH (>C10-C21)	10	<10	<10	756	76	13/15-Sep-06
TPH (>C21-<C32)	50	<50	<50			13/15-Sep-06
Modified TPH (Tier 1)**		<70	<70	-	-	-
Hydrocarbon Identification		-	-	-	-	-
BTEX, TPH (C6-C10)						
Surrogate Recovery						
Difluorobenzene (%)		97	100	96	96	14-Sep-06
4-Bromofluorobenzene (%)		83	98	94	94	14-Sep-06
Trifluorotoluene (%)		104	105	104	104	14-Sep-06
TPH (>C10-<C32)						
Surrogate Recovery						
O-Terphenyl (%)		94	75	88	88	13/15-Sep-06

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	4 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Comments:

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable

Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppm (ug/g)

Results reported on dry weight basis.

Analysts: M. Mak, C. Chem.
M. Cojocar, B.Sc.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 21, 2006
		Page:	1 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10579 RMM-TP1-SS2 06-Sep-06 (ug/g)	S2006-10579 RMM-TP1-SS2 06-Sep-06 (ug/g)	S2006-10580 RMM-TP2-SS2 06-Sep-06 (ug/g)	S2006-10581 RPF-TP1-SS2 06-Sep-06 (ug/g)	S2006-10585 RPF-TP5-SS3 06-Sep-06 (ug/g)	S2006-10586 RPF-TP6-SS1 06-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.04	0.05	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	0.03	0.03	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	0.15	0.14	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	0.11	0.10	<0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**0.33**	**0.32**	**<0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	14	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	14	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	26	N/R	<10 (<10)	<10	<10	<10
TPH (>C21-<C32)	50	234	N/R	<50 (<50)	<50	<50	<50
Modified TPH (Tier 1)**		274	-	<70	<70	<70	<70
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	-	-	-	-	-
BTEX, TPH (C6-C10)							
Surrogate Recovery							
Difluorobenzene (%)		103	101	101	102	100	99
4-Bromofluorobenzene (%)		79	82	75	78	84	90
Trifluorotoluene (%)		99	98	99	103	101	100
TPH (>C10-<C32)							
Surrogate Recovery							
O-Terphenyl (%)		88	N/R	67 (71)	69	79	76

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 21, 2006
		Page:	2 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-10588 RPF-TP8-SS3 06-Sep-06 (ug/g)	S2006-10593 DUP 1 06-Sep-06 (ug/g)	S2006-10595 DUP 3 06-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			
Benzene	0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02
TOTAL BTEX	**0.10**	**<0.10**	**<0.10**	**<0.10**
TPH (C6-C10)	10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10
TPH (>C10-C21)	10	<10	<10	<10
TPH (>C21-<C32)	50	<50	<50	<50
Modified TPH (Tier 1)**		<70	<70	<70
Hydrocarbon Identification		-	-	-
BTEX, TPH (C6-C10)				
Surrogate Recovery				
Difluorobenzene (%)		101	101	104
4-Bromofluorobenzene (%)		80	92	91
Trifluorotoluene (%)		101	102	100
TPH (>C10-<C32)				
Surrogate Recovery				
O-Terphenyl (%)		84	64	67

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		Page:	3 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

		Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Benzene	0.01	<0.01	2.10	84	14-Sep-06
Toluene	0.01	<0.01	2.09	84	14-Sep-06
Ethylbenzene	0.02	<0.02	2.08	83	14-Sep-06
m+p-Xylene	0.04	<0.04	2.07	83	14-Sep-06
o-Xylene	0.02	<0.02	2.03	81	14-Sep-06
TOTAL BTEX	**0.10**	**<0.10**	**10.4**	**83**	14-Sep-06
TPH (C6-C10)	10	<10	80.6	81	14-Sep-06
TPH (C6-C10) less BTEX	10	<10	70.2	82	14-Sep-06
TPH (>C10-C21)	10	<10	756	76	13/14-Sep-06
TPH (>C21-<C32)	50	<50			13/14-Sep-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification		-	-	-	-
BTEX, TPH (C6-C10)					
Surrogate Recovery					
Difluorobenzene (%)		99	100	100	14-Sep-06
4-Bromofluorobenzene (%)		83	94	94	14-Sep-06
Trifluorotoluene (%)		99	99	99	14-Sep-06
TPH (>C10-<C32)					
Surrogate Recovery					
O-Terphenyl (%)		73	88	88	13/14-Sep-06

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		Page:	4 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Comments:

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable
Total hydrocarbons quantified as Toluene/Diesel
Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
Values in ppm (ug/g)
Results reported on dry weight basis

N/R No Lab Replicate

Analysts: M. Mak, C. Chem.
M. Cojocar, B.Sc.

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Client:	AMEC Earth and Environmental a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Revised Date: Page:	October 18, 2006 October 20, 2006 1 of 3
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493/01
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit			S2006-10852 RMM-MW1 12-Sep-06 (µg/L)	S2006-10853 RMM-MW2 13-Sep-06 (µg/L)	S2006-10853 RMM-MW2 13-Sep-06 (µg/L)	S2006-10854 RMM-MW3 13-Sep-06 (µg/L)	S2006-10855 RMM-MW4 13-Sep-06 (µg/L)
Parameters	**MDL* (µg/L)**	**RDL ** (µg/L)**			**(Replicate)**		
Benzene	0.2	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Toluene	0.2	0.4	<0.4	0.5	0.4	<0.4	<0.4
Ethylbenzene	0.3	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
m+p-Xylene	0.4	0.8	1.0	<0.8	<0.8	0.9	0.7
o-Xylene	0.3	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
TPH (C6-C10)	50	50	<50	<50	<50	<50	<50
TPH (C6-C10) less BTEX	50	50	<50	<50	<50	<50	<50
TPH (>C10-C21)	50	50	<50	<50	N/R	<50	<50
TPH (>C21-<C32)	50	50	<50	<50	N/R	<50	52
Modified TPH (Tier 1)***			<150	<150	-	<150	<152
Hydrocarbon Identification			-	-	-	-	Too low to identify
BTEX, TPH (C6-C10) Surrogate Recovery							
Dibromofluoromethane (%)			98	96	98	100	97
4-Bromofluorobenzene (%)			102	101	100	102	100
TPH (>C10-<C32) Surrogate Recovery							
O-Terphenyl (%)			64	73	N/R	64	81

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Client:	AMEC Earth and Environmental a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Revised Date: Page:	October 18, 2006 October 20, 2006 2 of 3
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493/01
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit			S2006-10856 RMM-MW5 13-Sep-06 (µg/L)	S2006-10857 RMM-MW6 13-Sep-06 (µg/L)	S2006-10867 RPF-MW1 14-Sep-06 (µg/L)
Parameters	**MDL* (µg/L)**	**RDL ** (µg/L)**			
Benzene	0.2	0.4	<0.4	<0.4	<0.4
Toluene	0.2	0.4	<0.4	0.3	2.9
Ethylbenzene	0.3	0.6	<0.6	54.9	0.6
m+p-Xylene	0.4	0.8	<0.8	3.5	2.5
o-Xylene	0.3	0.6	<0.6	<0.6	1.2
TPH (C6-C10)	50	50	<50	258	<50
TPH (C6-C10) less BTEX	50	50	<50	<50	<50
TPH (>C10-C21)	50	50	<50	1260	<50
TPH (>C21-<C32)	50	50	<50	<50	<50
Modified TPH (Tier 1)***			<150	<1360	<150
Hydrocarbon Identification			-	Chromatogram resembles diesel	-
BTEX, TPH (C6-C10) Surrogate Recovery					
Dibromofluoromethane (%)			98	98	97
4-Bromofluorobenzene (%)			102	102	103
TPH (>C10-<C32) Surrogate Recovery					
O-Terphenyl (%)			89	74	76

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Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493/01
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

			Lab Blank (µg/L)	Blank Spike (µg/L)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/L)**	**RDL ** (µg/L)**				
Benzene	0.2	0.4	<0.4	57.0	114	19/22-Sep-06
Toluene	0.2	0.4	<0.4	57.7	115	19/22-Sep-06
Ethylbenzene	0.3	0.6	<0.6	56.6	113	19/22-Sep-06
m+p-Xylene	0.4	0.8	<0.8	56.8	114	19/22-Sep-06
o-Xylene	0.3	0.6	<0.6	56.6	113	19/22-Sep-06
TPH (C6-C10)	50	50	<50	789	79	19/22-Sep-06
TPH (C6-C10) lessBTEX	50	50	<50	504	96	19/22-Sep-06
TPH (>C10-C21)	50	50	<50	13100	105	21/22-Sep-06
TPH (>C21-<C32)	50	50	<50			21/22-Sep-06
Modified TPH (Tier 1)***			<150	-	-	-
Hydrocarbon Identification			-	-	-	-
BTEX, TPH (C6-C10) Surrogate Recovery						
Dibromofluoromethane (%)			97	95	95	19/22-Sep-06
4-Bromofluorobenzene (%)			96	101	101	19/22-Sep-06
TPH (>C10-<C32) Surrogate Recovery						
O-Terphenyl (%)			85	117	117	21/22-Sep-06

Comments:

* Method Detection Limit

** Reporting Detection Limit

*** Modified TPH is the total of TPH Purgeable and Extractable
Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppb (ug/L)

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Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10629	EMTP1-SS1	09-Sep-06	<0.005	80
S2006-10632	EMTP4-SS2	09-Sep-06	<0.005	86
S2006-10633	EMTP5-SS1	09-Sep-06	0.131	85
S2006-10634	EMTP6-SS1	09-Sep-06	<0.005	89
S2006-10635	EMTP7-SS1	09-Sep-06	0.015	83
S2006-10638	EMTP10-SS4	09-Sep-06	<0.005 (<0.005)	81 (92)
S2006-10639	EMTP11-SS1	09-Sep-06	<0.005	74
S2006-10640	EMTP12-SS1	09-Sep-06	<0.005	76
S2006-10641	EMTP13-SS1	09-Sep-06	<0.005	84
S2006-10643	EMTP15-SS1	09-Sep-06	0.199	78
S2006-10644	EMTP16-SS1	09-Sep-06	6.21	125
S2006-10645	RMM-TP30-SS1	09-Sep-06	<0.005	76
S2006-10652	DUP 9	09-Sep-06	<0.005	94
S2006-10654	RMM-SED1	09-Sep-06	<0.005 (<0.005)	73 (79)
S2006-10655	RMM-SED2	09-Sep-06	<0.05 *	106
S2006-10656	RMM-SED3	09-Sep-06	<0.005	101
Lab Blank			<0.005	84
Blank Spike			0.063	89
Blank Spike Recovery (%)			79	89
Date of Analysis			13/18-Sep-06	13/18-Sep-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) signifies Lab Replicate
*** Higher MDL reported due to dilution factor of 10**

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
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Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 03, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10883	RMM-TP35-SS1	11-Sep-06	<0.005	80
S2006-10884	RMM-TP36-SS1	11-Sep-06	<0.005	102
S2006-10885	RMM-TP37-SS1	11-Sep-06	<0.005 (<0.005)	88 (112)
S2006-10886	RMM-TP38-SS1	11-Sep-06	<0.005	95
S2006-10887	RMM-TP39-SS1	11-Sep-06	<0.005	96
S2006-10888	Dup C	11-Sep-06	<0.005	88
S2006-10899	BH-TP11-SS1	11-Sep-06	<0.005	86
S2006-10901	BH-TP13-SS1	11-Sep-06	<0.005	91
S2006-10919	TAIL-TP1	12-Sep-06	<0.005	89
Lab Blank			<0.005	87
Blank Spike			0.062	91
Blank Spike Recovery (%)			78	91
Date of Analysis			21-Sep-06	21-Sep-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) signifies Lab Replicate

Analyst: S. Lam, C. Chem.

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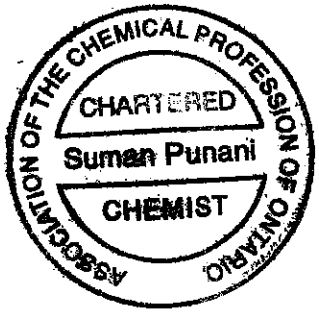

Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 21, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10582	RPF-TP2-SS4	06-Sep-06	<0.005	84
S2006-10586	RPF-TP6-SS1	06-Sep-06	<0.005	79
Lab Blank			<0.005	84
Blank Spike			0.063	89
Blank Spike Recovery (%)			79	89
Date of Analysis			13-Sep-06	13-Sep-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10625	RMM-TP29-SS4	08-Sep-06	<0.005	79
Lab Blank			<0.005	84
Blank Spike			0.063	89
Blank Spike Recovery (%)			79	89
Date of Analysis			13/18-Sep-06	13/18-Sep-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab. Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-10600	RMM-TP7-SS2	07-Sep-06	<0.005	87
S2006-10601	RMM-TP8-SS1	07-Sep-06	<0.005	80
Lab Blank			<0.005	84
Blank Spike			0.063	89
Blank Spike Recovery (%)			79	89
Date of Analysis			13/18-Sep-06	13/18-Sep-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	1 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-10636 EM-TP8-SS1 09-Sep-06 (µg/g)	S2006-10638 EM-TP10-SS4 09-Sep-06 (µg/g)	S2006-10638 EM-TP10-SS4 09-Sep-06 (µg/g)	S2006-10639 EM-TP11-SS1 09-Sep-06 (µg/g)	S2006-10640 EM-TP12-SS1 09-Sep-06 (µg/g)	S2006-10645 RMM-TP30-SS1 09-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dilution Factor		1	1	1	1	1	1
Surrogate Recovery							
Naphthalene-d8 (%)		68	67	73	65	67	72
Antracene-d10 (%)		98	83	102	91	87	112
Perylene-d12 (%)		96	96	101	99	87	101
Date of Analysis		18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06

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		Page:	2 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-10647 RMM-TP32-SS1 09-Sep-06 (µg/g)	S2006-10654 RMM-SED1 09-Sep-06 (µg/g)	S2006-10654 RMM-SED1 09-Sep-06 (µg/g)	S2006-10655 RMM-SED2 09-Sep-06 (µg/g)	S2006-10656 RMM-SED3 09-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**	**	
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.004	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.004	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.002	0.011
Anthracene	0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Fluoranthene	0.001	<0.001	<0.001	0.002	<0.002	0.021
Pyrene	0.003	<0.003	0.003	<0.003	<0.002	0.010
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.002	0.016
Chrysene	0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.008	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.008	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.006	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.006	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.008	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.004	<0.002
Dilution Factor		1	1	1	2	1
Surrogate Recovery						
Naphthalene-d8 (%)		67	70	68	67	66
Antracene-d10 (%)		106	102	104	88	103
Perylene-d12 (%)		83	96	104	75	106
Date of Analysis		18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06

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		Page:	3 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

		Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**			
Naphthalene	0.002	<0.002	0.147	73
Acenaphthylene	0.001	<0.001	0.156	78
Acenaphthene	0.002	<0.002	0.163	81
Fluorene	0.001	<0.001	0.196	98
Phenanthrene	0.001	<0.001	0.181	91
Anthracene	0.001	<0.001	0.184	92
Fluoranthene	0.001	<0.001	0.233	117
Pyrene	0.003	<0.003	0.248	124
Benzo(a)anthracene	0.001	<0.001	0.215	107
Chrysene	0.001	<0.001	0.183	92
Benzo(b)fluoranthene	0.004	<0.004	0.202	101
Benzo(k)fluoranthene	0.004	<0.004	0.177	89
Benzo(a)pyrene	0.003	<0.003	0.187	94
Indeno(123 cd.)pyrene	0.003	<0.003	0.221	110
Dibenzo(ah)anthracene	0.004	<0.004	0.203	101
Benzo(ghi)perylene	0.002	<0.002	0.178	89
Dilution Factor		1	1	1
Surrogate Recovery				
Naphthalene-d8 (%)		71	71	71
Antracene-d10 (%)		97	99	99
Perylene-d12 (%)		97	97	97

Comments:

* Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

** **Higher MDL reported due to sample dilution factor of 2**

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-10598 RMM-TP5-SS1 07-Sep-06 (µg/g)	S2006-10607 RMM-TP14-SS2 07-Sep-06 (µg/g)	S2006-10611 DUP 5 07-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**						
Naphthalene	0.002	0.036	<0.002	0.022	<0.002	0.147	73
Acenaphthylene	0.001	0.037	<0.001	<0.001	<0.001	0.156	78
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	0.163	81
Fluorene	0.001	0.035	<0.001	0.012	<0.001	0.196	98
Phenanthrene	0.001	0.093	<0.001	0.036	<0.001	0.181	91
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	0.184	92
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	0.233	117
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	0.248	124
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	0.215	107
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	0.183	92
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	0.202	101
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	0.177	89
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	0.187	94
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	0.221	110
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	0.203	101
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	0.178	89
Dilution Factor		1	1	1	1	1	1
Surrogate Recovery							
Naphthalene-d8 (%)		67	69	64	71	71	71
Antracene-d10 (%)		85	97	121	97	99	99
Perylene-d12 (%)		76	83	128	97	97	97
Date of Analysis		15/16-Sep-06	15/16-Sep-06	15/16-Sep-06	15/16-Sep-06	15/16-Sep-06	15/16-Sep-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

Analyst: S. Lam, C. Chem.
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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-10586 RPF-TP6-SS1 06-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**				
Naphthalene	0.002	<0.002	<0.002	0.147	73
Acenaphthylene	0.001	<0.001	<0.001	0.156	78
Acenaphthene	0.002	<0.002	<0.002	0.163	81
Fluorene	0.001	<0.001	<0.001	0.196	98
Phenanthrene	0.001	<0.001	<0.001	0.181	91
Anthracene	0.001	<0.001	<0.001	0.184	92
Fluoranthene	0.001	<0.001	<0.001	0.233	117
Pyrene	0.003	<0.003	<0.003	0.248	124
Benzo(a)anthracene	0.001	<0.001	<0.001	0.215	107
Chrysene	0.001	<0.001	<0.001	0.183	92
Benzo(b)fluoranthene	0.004	<0.004	<0.004	0.202	101
Benzo(k)fluoranthene	0.004	<0.004	<0.004	0.177	89
Benzo(a)pyrene	0.003	<0.003	<0.003	0.187	94
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	0.221	110
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	0.203	101
Benzo(ghi)perylene	0.002	<0.002	<0.002	0.178	89
Dilution Factor		1	1	1	1
Surrogate Recovery					
Naphthalene-d8 (%)		67	71	71	71
Antracene-d10 (%)		84	97	99	99
Perylene-d12 (%)		83	97	97	97
Date of Analysis		18-Sep-06	18-Sep-06	18-Sep-06	18-Sep-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A/.Q.C. Officer

Suman Punani, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-10625 RMM-TP29-SS4 08-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**				
Naphthalene	0.002	<0.002	<0.002	0.147	73
Acenaphthylene	0.001	<0.001	<0.001	0.156	78
Acenaphthene	0.002	<0.002	<0.002	0.163	81
Fluorene	0.001	<0.001	<0.001	0.196	98
Phenanthrene	0.001	<0.001	<0.001	0.181	91
Anthracene	0.001	<0.001	<0.001	0.184	92
Fluoranthene	0.001	<0.001	<0.001	0.233	117
Pyrene	0.003	<0.003	<0.003	0.248	124
Benzo(a)anthracene	0.001	<0.001	<0.001	0.215	107
Chrysene	0.001	<0.001	<0.001	0.183	92
Benzo(b)fluoranthene	0.004	<0.004	<0.004	0.202	101
Benzo(k)fluoranthene	0.004	<0.004	<0.004	0.177	89
Benzo(a)pyrene	0.003	<0.003	<0.003	0.187	94
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	0.221	110
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	0.203	101
Benzo(ghi)perylene	0.002	<0.002	<0.002	0.178	89
Dilution Factor		1	1	1	1
Surrogate Recovery					
Naphthalene-d8 (%)		67	71	71	71
Antracene-d10 (%)		121	97	99	99
Perylene-d12 (%)		73	97	97	97
Date of Analysis		15-Sep-06	15-Sep-06	15-Sep-06	15-Sep-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

Analyst: S. Lam, C. Chem.
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		Page:	1 of 2
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number		S2006-10613	S2006-10615	S2006-10622	S2006-10625	S2006-10625	S2006-10627
Sample ID		RMM-TP17-SS3	RMM-TP19-SS1	RMM-TP26-SS1	RMM-TP29-SS4	RMM-TP29-SS4	DUP 12
Date Collected		08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06
Unit		(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)
Parameters	**MDL* (µg/g)**					**(Replicate)**	
Aluminum	5	15000	14900	18900	19700	19800	18100
Antimony	0.5	<0.5	2.0	3.1	2.4	2.5	2.7
Arsenic	0.5	1.6	116	51.9	21.7	21.7	61.5
Barium	0.5	31.2	24.6	71.3	24.0	24.2	20.8
Beryllium	0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2
Bismuth	0.2	<0.2	2.2	1.0	0.9	1.0	1.3
Cadmium	0.5	<0.5	3.9	0.8	0.9	0.8	2.7
Calcium	25	5560	914	3160	1120	1140	805
Chromium	1	25	79	21	138	140	98
Cobalt	1	10	15	20	13	13	15
Copper	1	60	2200	564	1570	1550	1580
Iron	5	5290	98500	44700	73300	74300	61800
Lead	5	<5	214	64	30	31	132
Magnesium	10	453	14900	17400	21300	21500	18400
Manganese	1	116	202	554	260	264	244
Mercury	0.01	0.08	0.45	0.17	0.09	0.08	0.24
Molybdenum	2	<2	8	2	3	3	5
Nickel	5	28	21	10	27	28	25
Phosphorus	5	328	597	1010	714	731	483
Potassium	10	25	1360	4630	1590	1610	879
Selenium	0.1	0.8	0.8	0.8	0.6	N/R	0.4
Silver	0.25	<0.25	0.55	0.62	0.96	0.98	0.61
Sodium	25	115	153	220	313	317	128
Vanadium	5	5	73	92	70	71	74
Zinc	2	115	1080	198	209	210	823

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	2 of 2
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

		Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Aluminum	5	<5	1.00	1.00	15-Sep-06
Antimony	0.5	<0.5	1.00	1.00	15-Sep-06
Arsenic	0.5	<0.5	1.01	1.00	15-Sep-06
Barium	0.5	<0.5	0.53	0.50	15-Sep-06
Beryllium	0.2	<0.2	0.51	0.50	15-Sep-06
Bismuth	0.2	<0.2	1.02	1.00	15-Sep-06
Cadmium	0.5	<0.5	0.53	0.50	15-Sep-06
Calcium	25	<25	10.1	10.0	15-Sep-06
Chromium	1	<1	0.51	0.50	15-Sep-06
Cobalt	1	<1	0.54	0.50	15-Sep-06
Copper	1	<1	1.00	1.00	15-Sep-06
Iron	5	<5	1.03	1.00	15-Sep-06
Lead	5	<5	1.04	1.00	15-Sep-06
Magnesium	10	<10	3.96	4.00	15-Sep-06
Manganese	1	<1	0.53	0.50	15-Sep-06
Mercury	0.01	<0.01	0.002	0.002	19-Sep-06
Molybdenum	2	<2	1.00	1.00	15-Sep-06
Nickel	5	<5	0.99	1.00	15-Sep-06
Phosphorus	5	<5	1.97	2.00	15-Sep-06
Potassium	10	<10	18.4	20.0	15-Sep-06
Selenium	0.1	<0.1	0.003	0.003	19-Sep-06
Silver	0.25	<0.25	1.07	1.00	15-Sep-06
Sodium	25	<25	20.1	20.0	15-Sep-06
Vanadium	5	<5	0.53	0.50	15-Sep-06
Zinc	2	<2	0.52	0.50	15-Sep-06

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Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method

/bpj

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	1 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10634 EM-TP6-SS1 09-Sep-06 (ug/g)	S2006-10636 EM-TP8-SS1 09-Sep-06 (ug/g)	S2006-10637 EM-TP9-SS1 09-Sep-06 (ug/g)	S2006-10638 EM-TP10-SS4 09-Sep-06 (ug/g)	S2006-10638 EM-TP10-SS4 09-Sep-06 (ug/g)	S2006-10639 EM-TP11-SS1 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**					**(Replicate)**	
Aluminum	5	8310	17200	25	19100	19200	10200
Antimony	0.5	0.9	1.7	2.3	1.4	1.5	8.2
Arsenic	0.5	3.8	23.6	24.7	3.8	3.5	186
Barium	0.5	15.4	23.0	13.0	32.1	31.7	41.7
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.2	0.8	0.6	0.2	0.2	3.5
Cadmium	0.5	<0.5	1.0	0.8	<0.5	<0.5	1.2
Calcium	25	865	19400	4730	2220	2170	819
Chromium	1	65	98	73	113	112	67
Cobalt	1	10	27	16	22	22	7
Copper	1	155	1740	767	184	186	1280
Iron	5	22100	47400	37900	39700	39500	53500
Lead	5	<5	26	46	7	6	486
Magnesium	10	8030	18100	15200	17600	17700	10100
Manganese	1	156	552	517	507	507	163
Mercury	0.01	<0.01	0.04	0.08	<0.01	<0.01	2.54
Molybdenum	2	<2	2	2	<2	<2	13
Nickel	5	19	49	42	40	40	15
Phosphorus	5	355	491	505	588	589	436
Potassium	10	451	542	485	1040	1030	2660
Selenium	0.1	0.1	0.7	0.7	<0.1	<0.1	13.2
Silver	0.25	<0.25	0.32	0.39	<0.25	<0.25	0.69
Sodium	25	204	169	137	180	180	303
Vanadium	5	31	53	53	69	68	62
Zinc	2	26	200	232	60	60	101

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	2 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10640 EM-TP12-SS1 09-Sep-06 (ug/g)	S2006-10641 EM-TP13-SS1 09-Sep-06 (ug/g)	S2006-10643 EM-TP15-SS1 09-Sep-06 (ug/g)	S2006-10645 RMM-TP30-SS1 09-Sep-06 (ug/g)	S2006-10647 RMM-TP32-SS1 09-Sep-06 (ug/g)	S2006-10653 DUP 10 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Aluminum	5	25600	15500	20200	18100	13900	16200
Antimony	0.5	3.4	1.5	2.7	1.7	2.4	1.4
Arsenic	0.5	39.0	17.6	20.9	11.1	72.8	17.8
Barium	0.5	14.8	21.0	37.1	8.0	17.5	20.9
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	1.0	0.6	1.4	0.2	0.5	0.5
Cadmium	0.5	0.6	<0.5	0.8	<0.5	0.7	<0.5
Calcium	25	609	3020	412	2380	817	2680
Chromium	1	203	35	189	88	124	34
Cobalt	1	10	20	13	19	15	20
Copper	1	19500	249	1980	221	396	262
Iron	5	95300	47300	81000	48100	46100	51600
Lead	5	50	13	439	9	54	13
Magnesium	10	27500	12100	20900	14100	14900	12300
Manganese	1	437	431	399	416	345	450
Mercury	0.01	0.58	0.16	0.46	0.08	0.16	0.10
Molybdenum	2	7	2	13	<2	2	2
Nickel	5	29	13	32	12	29	13
Phosphorus	5	648	734	535	576	411	772
Potassium	10	743	680	765	248	708	637
Selenium	0.1	<0.1	0.2	10.1	0.2	6.5	0.9
Silver	0.25	0.65	<0.25	1.25	<0.25	<0.25	<0.25
Sodium	25	212	236	218	233	136	119
Vanadium	5	109	95	73	89	67	94
Zinc	2	126	112	192	84	98	108

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 02, 2006
		Page:	3 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10654 RMM SED-1 09-Sep-06 (ug/g)	S2006-10655 RMM SED-2 09-Sep-06 (ug/g)	S2006-10656 RMM SED-3 09-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			
Aluminum	5	10800	8540	3490
Antimony	0.5	1.8	14.2	8.5
Arsenic	0.5	43.6	226	1780
Barium	0.5	19.8	19.9	56.0
Beryllium	0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.4	5.0	3.4
Cadmium	0.5	<0.5	4.3	9.7
Calcium	25	463	4060	893
Chromium	1	91	38	31
Cobalt	1	11	29	9
Copper	1	273	5510	815
Iron	5	45200	108000	180000
Lead	5	109	510	123
Magnesium	10	11500	7830	2620
Manganese	1	195	150	169
Mercury	0.01	0.34	3.09	0.34
Molybdenum	2	4	12	6
Nickel	5	21	12	6
Phosphorus	5	261	586	2540
Potassium	10	887	1180	1680
Selenium	0.1	3.3	0.3	0.8
Silver	0.25	0.30	0.43	0.98
Sodium	25	173	125	430
Vanadium	5	63	39	53
Zinc	2	60	754	162

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		Page:	4 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

		Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Aluminum	5	<5	1.00	1.00	15/18-Sep-06
Antimony	0.5	<0.5	1.00	1.00	15/18-Sep-06
Arsenic	0.5	<0.5	1.01	1.00	15/18-Sep-06
Barium	0.5	<0.5	0.53	0.50	15/18-Sep-06
Beryllium	0.2	<0.2	0.51	0.50	15/18-Sep-06
Bismuth	0.2	<0.2	1.02	1.00	15/18-Sep-06
Cadmium	0.5	<0.5	0.53	0.50	15/18-Sep-06
Calcium	25	<25	10.1	10.0	15/18-Sep-06
Chromium	1	<1	0.51	0.50	15/18-Sep-06
Cobalt	1	<1	0.54	0.50	15/18-Sep-06
Copper	1	<1	1.00	1.00	15/18-Sep-06
Iron	5	<5	1.03	1.00	15/18-Sep-06
Lead	5	<5	1.04	1.00	15/18-Sep-06
Magnesium	10	<10	3.96	4.00	15/18-Sep-06
Manganese	1	<1	0.53	0.50	15/18-Sep-06
Mercury	0.01	<0.01	0.002	0.002	19-Sep-06
Molybdenum	2	<2	1.00	1.00	15/18-Sep-06
Nickel	5	<5	0.99	1.00	15/18-Sep-06
Phosphorus	5	<5	1.97	2.00	15/18-Sep-06
Potassium	10	<10	18.4	20.0	15/18-Sep-06
Selenium	0.1	<0.1	0.003	0.003	18/19-Sep-06
Silver	0.25	<0.25	1.07	1.00	15/18-Sep-06
Sodium	25	<25	20.1	20.0	15/18-Sep-06
Vanadium	5	<5	0.53	0.50	15/18-Sep-06
Zinc	2	<2	0.52	0.50	15/18-Sep-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1465
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Lead

Parameter Method Detection Limit Unit			Total Lead 5 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10630	EM-TP2-SS1	09-Sep-06	23
S2006-10631	EM-TP3-SS1	09-Sep-06	39
Lab Blank			<5
Q.C. Standard Actual (mg/L)			1.04
Q.C. Standard Expected (mg/L)			1.00
Date of Analysis			15-Sep-06

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

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Laboratory Manager

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		Page:	1 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number		S2006-10904	S2006-10904	S2006-10905	S2006-10906	S2006-10907	S2006-10908
Sample ID		TAIL-TL1	TAIL-TL1	TAIL-TL2	TAIL-TL3	TAIL-TL4	TAIL-SED1
Date Collected		11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	12-Sep-06
Unit		(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Aluminum	5	6680	6270	2650	2600	6620	13400
Antimony	0.5	10.7	9.4	11.1	5.8	3.2	4.0
Arsenic	0.5	387	359	229	166	270	706
Barium	0.5	18.3	17.3	18.2	16.1	17.8	1.8
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	14.2	13.1	6.9	5.9	13.0	5.7
Cadmium	0.5	1.7	1.5	2.5	1.5	2.6	14.2
Calcium	25	3570	3320	6030	6770	10300	7220
Chromium	1	27	25	12	13	29	32
Cobalt	1	94	89	77	54	47	121
Copper	1	4390	4320	6840	1440	614	2520
Iron	5	270000	272000	193000	87900	71900	167000
Lead	5	263	248	1260	796	704	152
Magnesium	10	6120	5780	2050	1910	6620	9940
Manganese	1	116	111	37	37	82	203
Mercury	0.01	0.42	0.40	5.34	9.94	10.5	4.20
Molybdenum	2	21	20	33	29	25	19
Nickel	5	17	16	14	12	12	30
Phosphorus	5	359	258	158	111	102	352
Potassium	10	1300	1250	1580	1590	1660	1960
Selenium	0.1	0.4	0.4	<0.1	13.2	12.8	6.3
Silver	0.25	2.67	2.54	1.38	1.26	0.51	2.86
Sodium	25	259	248	304	287	346	420
Vanadium	5	40	38	20	19	38	64
Zinc	2	114	109	496	218	681	1700

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		Page:	2 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number		S2006-10909	S2006-10910	S2006-10911	S2006-10912	S2006-10913	S2006-10914
Sample ID		TAIL-SED2	TAIL-SED3	TAIL-SED4	TAIL-SED5	TAIL-SED6	TAIL-SED7
Date Collected		12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06
Unit		(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)
Parameters	**MDL* (µg/g)**						
Aluminum	5	28300	25400	23300	33400	25500	4980
Antimony	0.5	2.3	1.6	1.5	3.5	2.9	3.8
Arsenic	0.5	434	2.2	1.4	47.8	14.8	219
Barium	0.5	4.0	23.9	12.0	25.6	8.2	5.1
Beryllium	0.2	0.2	<0.2	<0.2	0.3	<0.2	<0.2
Bismuth	0.2	2.9	<0.2	0.2	1.8	1.5	3.7
Cadmium	0.5	22.6	<0.5	<0.5	7.1	0.7	1.3
Calcium	25	4910	9480	7160	3400	8920	2370
Chromium	1	112	204	187	178	78	12
Cobalt	1	195	37	19	193	41	96
Copper	1	2300	57	117	2380	1350	3560
Iron	5	51200	37800	32500	115000	84500	123000
Lead	5	191	8	9	100	60	66
Magnesium	10	18400	21900	18900	19900	18900	2380
Manganese	1	386	1580	429	886	471	69
Mercury	0.01	1.88	0.07	0.06	0.28	0.49	1.55
Molybdenum	2	8	<2	<2	8	2	13
Nickel	5	62	65	56	112	66	21
Phosphorus	5	250	181	78	606	125	227
Potassium	10	1630	585	392	502	549	779
Selenium	0.1	16.7	<0.1	<0.1	0.2	<0.1	21.7
Silver	0.25	2.24	<0.25	<0.25	0.86	4.44	1.55
Sodium	25	473	430	293	235	301	215
Vanadium	5	28	67	13	101	33	23
Zinc	2	5540	48	75	2330	389	87

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		Page:	3 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10915 TAIL-SED8 12-Sep-06 (ug/g)	S2006-10916 DUP A 12-Sep-06 (ug/g)	S2006-10917 BRP-SED1 12-Sep-06 (ug/g)	S2006-10918 LRP-SED1 12-Sep-06 (ug/g)	S2006-10918 LRP-SED1 12-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**					**(Replicate)**
Aluminum	5	19200	2100	27800	17000	16800
Antimony	0.5	1.3	3.1	3.3	2.7	2.5
Arsenic	0.5	7.6	233	2.3	66.0	66.2
Barium	0.5	23.7	6.8	26.5	14.7	14.8
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.2	3.2	1.6	0.4	0.6
Cadmium	0.5	<0.5	1.4	<0.5	0.9	0.9
Calcium	25	9120	1590	3890	3630	3590
Chromium	1	118	8	152	170	169
Cobalt	1	24	56	35	16	16
Copper	1	150	3070	3180	1090	1110
Iron	5	41300	91900	123000	34400	33700
Lead	5	28	62	81	63	63
Magnesium	10	15100	1190	11300	15500	15200
Manganese	1	697	35	668	232	232
Mercury	0.01	0.08	0.22	0.04	0.30	0.30
Molybdenum	2	<2	14	5	3	3
Nickel	5	48	15	34	49	48
Phosphorus	5	214	189	553	157	157
Potassium	10	652	737	80	274	282
Selenium	0.1	<0.1	21.6	1.5	0.9	1.0
Silver	0.25	<0.25	0.89	<0.25	0.61	0.63
Sodium	25	412	133	237	255	260
Vanadium	5	59	12	50	54	54
Zinc	2	107	121	76	195	191

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		Page:	4 of 4
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

		Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (µg/g)**				
Aluminum	5	<5	1.04	1.00	23/28-Sep-06
Antimony	0.5	<0.5	1.01	1.00	23/28-Sep-06
Arsenic	0.5	<0.5	1.13	1.00	23/28-Sep-06
Barium	0.5	<0.5	0.54	0.50	23/28-Sep-06
Beryllium	0.2	<0.2	0.51	0.50	23/28-Sep-06
Bismuth	0.2	<0.2	1.02	1.00	23/28-Sep-06
Cadmium	0.5	<0.5	0.50	0.50	23/28-Sep-06
Calcium	25	<25	10.9	10.0	23/28-Sep-06
Chromium	1	<1	0.52	0.50	23/28-Sep-06
Cobalt	1	<1	0.53	0.50	23/28-Sep-06
Copper	1	<1	1.02	1.00	23/28-Sep-06
Iron	5	<5	1.06	1.00	23/28-Sep-06
Lead	5	<5	1.00	1.00	23/28-Sep-06
Magnesium	10	<10	4.14	4.00	23/28-Sep-06
Manganese	1	<1	0.54	0.50	23/28-Sep-06
Mercury	0.01	<0.01	0.002	0.002	26-Sep-06
Molybdenum	2	<2	1.02	1.00	23/28-Sep-06
Nickel	5	<5	1.01	1.00	23/28-Sep-06
Phosphorus	5	<5	1.93	2.00	23/28-Sep-06
Potassium	10	<10	18.9	20.0	23/28-Sep-06
Selenium	0.1	<0.1	0.003	0.003	26-Sep-06
Silver	0.25	<0.25	1.09	1.00	23/28-Sep-06
Sodium	25	<25	21.1	20.0	23/28-Sep-06
Vanadium	5	<5	0.53	0.50	23/28-Sep-06
Zinc	2	<2	0.52	0.50	23/28-Sep-06

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Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

/bpj

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10609 RMM-TP16-SS1 07-Sep-06 (ug/g)	Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (µg/g)**					
Aluminum	5	14600	<5	1.00	1.00	15-Sep-06
Antimony	0.5	2.5	<0.5	1.00	1.00	15-Sep-06
Arsenic	0.5	249	<0.5	1.01	1.00	15-Sep-06
Barium	0.5	5.7	<0.5	0.53	0.50	15-Sep-06
Beryllium	0.2	<0.2	<0.2	0.51	0.50	15-Sep-06
Bismuth	0.2	1.4	<0.2	1.02	1.00	15-Sep-06
Cadmium	0.5	1.6	<0.5	0.53	0.50	15-Sep-06
Calcium	25	455	<25	10.1	10.0	15-Sep-06
Chromium	1	153	<1	0.51	0.50	15-Sep-06
Cobalt	1	17	<1	0.54	0.50	15-Sep-06
Copper	1	1200	<1	1.00	1.00	15-Sep-06
Iron	5	59600	<5	1.03	1.00	15-Sep-06
Lead	5	32	<5	1.04	1.00	15-Sep-06
Magnesium	10	16000	<10	3.96	4.00	15-Sep-06
Manganese	1	246	<1	0.53	0.50	15-Sep-06
Mercury	0.01	0.08	<0.01	0.002	0.002	19-Sep-06
Molybdenum	2	2	<2	1.00	1.00	15-Sep-06
Nickel	5	29	<5	0.99	1.00	15-Sep-06
Phosphorus	5	272	<5	1.97	2.00	15-Sep-06
Potassium	10	261	<10	18.4	20.0	15-Sep-06
Selenium	0.1	8.7	<0.1	0.003	0.003	19-Sep-06
Silver	0.25	0.38	<0.25	1.07	1.00	15-Sep-06
Sodium	25	123	<25	20.1	20.0	15-Sep-06
Vanadium	5	83	<5	0.53	0.50	15-Sep-06
Zinc	2	40	<2	0.52	0.50	15-Sep-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	1 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10579 RMM-TP1-SS2 06-Sep-06 (ug/g)	S2006-10581 RPF-TP1-SS2 06-Sep-06 (ug/g)	S2006-10581 RPF-TP1-SS2 06-Sep-06 (ug/g)	S2006-10582 RPF-TP2-SS4 06-Sep-06 (ug/g)	S2006-10583 RPF-TP3-SS1 06-Sep-06 (ug/g)	S2006-10584 RPF-TP4-SS1 06-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Aluminum	5	2550	17100	17300	17300	20600	14000
Antimony	0.5	1.6	1.0	0.8	1.0	2.1	5.7
Arsenic	0.5	162	1.4	1.1	3.9	117	185
Barium	0.5	38.6	35.3	35.3	27.4	20.2	15.5
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.6	0.3	0.3	0.4	2.4	2.8
Cadmium	0.5	8.6	<0.5	<0.5	<0.5	1.4	2.3
Calcium	25	1560	2180	2200	1930	8470	1990
Chromium	1	52	36	36	48	64	47
Cobalt	1	15	30	30	21	38	50
Copper	1	3550	136	136	153	1210	1670
Iron	5	37100	35500	35700	39300	103000	130000
Lead	5	50	<5	<5	10	204	215
Magnesium	10	1780	13100	13100	14400	16300	11600
Manganese	1	69	1020	1020	668	495	218
Mercury	0.01	0.17	0.03	0.03	0.05	2.15	1.88
Molybdenum	2	2	<2	2	2	10	11
Nickel	5	7	27	27	23	22	17
Phosphorus	5	1050	714	718	709	486	501
Potassium	10	77	1400	1400	1120	1570	916
Selenium	0.1	0.3	0.1	0.1	0.4	23.8	28.8
Silver	0.25	0.91	<0.25	<0.25	<0.25	1.28	1.00
Sodium	25	56	155	154	79	244	145
Vanadium	5	19	57	57	64	78	74
Zinc	2	1660	55	55	49	183	300

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		Page:	2 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number		S2006-10585	S2006-10586	S2006-10587	S2006-10588	S2006-10590	S2006-10594
Sample ID		RPF-TP5-SS3	RPF-TP6-SS1	RPF-TP7-SS1	RPF-TP8-SS3	RPF-SED1	DUP 2
Date Collected		06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06
Unit		(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)	(ug/g)
Parameters	**MDL* (µg/g)**						
Aluminum	5	26300	20000	18200	20800	25100	21500
Antimony	0.5	3.0	1.3	1.6	1.5	3.8	1.1
Arsenic	0.5	10.6	1.5	0.7	12.8	368	2.2
Barium	0.5	31.9	4.9	9.4	8.6	8.6	6.3
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2
Bismuth	0.2	0.9	<0.2	<0.2	0.5	5.6	<0.2
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	5.3	<0.5
Calcium	25	1340	699	1180	798	2410	949
Chromium	1	237	129	126	82	18	135
Cobalt	1	39	18	18	9	72	21
Copper	1	563	88	138	72	2410	135
Iron	5	66300	29400	29600	37100	196000	33200
Lead	5	11	<5	<5	17	183	6
Magnesium	10	24700	14400	14100	20400	19100	16200
Manganese	1	630	374	266	263	738	461
Mercury	0.01	0.06	0.06	0.05	0.13	4.05	0.12
Molybdenum	2	8	<2	<2	<2	15	<2
Nickel	5	76	36	41	22	24	40
Phosphorus	5	378	213	397	203	1680	261
Potassium	10	881	160	460	146	494	238
Selenium	0.1	3.7	0.2	0.2	0.8	30.6	0.2
Silver	0.25	<0.25	<0.25	<0.25	<0.25	0.87	<0.25
Sodium	25	76	99	87	46	174	146
Vanadium	5	81	58	57	73	77	66
Zinc	2	100	36	37	47	732	41

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		Page:	3 of 3
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-10594 DUP 2 06-Sep-06 (ug/g)	Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (µg/g)**	**(Replicate)**				
Aluminum	5	21400	<5	1.00	1.00	15-Sep-06
Antimony	0.5	1.6	<0.5	1.00	1.00	15-Sep-06
Arsenic	0.5	2.1	<0.5	1.01	1.00	15-Sep-06
Barium	0.5	6.2	<0.5	0.53	0.50	15-Sep-06
Beryllium	0.2	<0.2	<0.2	0.51	0.50	15-Sep-06
Bismuth	0.2	<0.2	<0.2	1.02	1.00	15-Sep-06
Cadmium	0.5	<0.5	<0.5	0.53	0.50	15-Sep-06
Calcium	25	919	<25	10.1	10.0	15-Sep-06
Chromium	1	131	<1	0.51	0.50	15-Sep-06
Cobalt	1	21	<1	0.54	0.50	15-Sep-06
Copper	1	133	<1	1.00	1.00	15-Sep-06
Iron	5	32800	<5	1.03	1.00	15-Sep-06
Lead	5	5	<5	1.04	1.00	15-Sep-06
Magnesium	10	16000	<10	3.96	4.00	15-Sep-06
Manganese	1	454	<1	0.53	0.50	15-Sep-06
Mercury	0.01	0.08	<0.01	0.002	0.002	19-Sep-06
Molybdenum	2	<2	<2	1.00	1.00	15-Sep-06
Nickel	5	39	<5	0.99	1.00	15-Sep-06
Phosphorus	5	254	<5	1.97	2.00	15-Sep-06
Potassium	10	237	<10	18.4	20.0	15-Sep-06
Selenium	0.1	0.2	<0.1	0.003	0.003	18/19-Sep-06
Silver	0.25	<0.25	<0.25	1.07	1.00	15-Sep-06
Sodium	25	143	<25	20.1	20.0	15-Sep-06
Vanadium	5	65	<5	0.53	0.50	15-Sep-06
Zinc	2	40	<2	0.52	0.50	15-Sep-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 18, 2006
		Page:	1 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab # Sample ID Date Collected			S2006-10840 Tail-SW1 12-Sep-06	S2006-10841 Tail-SW2 12-Sep-06	S2006-10842 Tail-SW3 12-Sep-06	S2006-10843 Tail-SW4 12-Sep-06	S2006-10844 Tail-SW5 12-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	3.68	4.51	3.97	0.280	0.139
Antimony	(mg/L)	0.001	0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	0.050	0.003	0.011	<0.001	<0.001
Barium	(mg/L)	0.001	0.007	0.009	0.008	0.006	0.009
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.010418	0.012977	0.011488	0.000020	0.000171
Calcium	(mg/L)	0.5	55.8	54.9	55.6	1.9	5.6
Chromium	(mg/L)	0.001	0.009	0.011	0.010	0.001	0.002
Cobalt	(mg/L)	0.001	0.075	0.089	0.080	<0.001	0.007
Copper	(mg/L)	0.001	1.11	1.11	1.11	0.003	0.024
Iron	(mg/L)	0.01	63.4	61.2	61.2	0.69	1.82
Lead	(mg/L)	0.002	0.073	0.089	0.081	<0.002	<0.002
Magnesium	(mg/L)	0.02	32.5	31.4	31.7	0.75	2.43
Manganese	(mg/L)	0.001	2.42	2.40	2.42	0.021	0.690
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.027	0.033	0.029	0.001	0.003
Phosphorous	(mg/L)	0.02	0.06	0.08	0.07	<0.02	0.06
Potassium	(mg/L)	0.02	4.98	4.80	4.83	0.23	2.20
Selenium	(mg/L)	0.001	0.001	<0.001	0.001	<0.001	<0.001
Silver	(mg/L)	0.0001	0.0001	0.0002	0.0001	0.0002	<0.0001
Sodium	(mg/L)	0.5	4.8	4.6	4.7	2.7	4.9
Vanadium	(mg/L)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	(mg/L)	0.005	5.19	5.13	5.18	0.006	0.044

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 18, 2006
		Page:	2 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10845	S2006-10846	S2006-10847	S2006-10848	S2006-10849
Sample ID			Tail-SW6	Tail-SW7	Tail-SW8	Tail-SW9	Tail-SW10
Date Collected			12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	0.446	0.888	12.3	0.605	1.40
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	0.003	0.007	0.002	<0.001	0.007
Barium	(mg/L)	0.001	0.004	0.014	0.014	0.005	0.005
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.000668	0.000753	0.003613	0.000880	0.002107
Calcium	(mg/L)	0.5	12.2	25.9	66.3	10.5	11.3
Chromium	(mg/L)	0.001	<0.001	0.001	0.016	0.001	0.001
Cobalt	(mg/L)	0.001	0.013	0.028	0.095	0.014	0.019
Copper	(mg/L)	0.001	0.211	0.172	0.823	0.275	0.959
Iron	(mg/L)	0.01	4.94	1.23	11.8	4.35	4.85
Lead	(mg/L)	0.002	<0.002	0.006	0.013	<0.002	<0.002
Magnesium	(mg/L)	0.02	3.99	7.04	33.1	3.11	3.49
Manganese	(mg/L)	0.001	0.416	1.54	3.27	0.401	0.665
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.005	0.009	0.072	0.006	0.009
Phosphorous	(mg/L)	0.02	<0.02	<0.02	0.03	<0.02	0.02
Potassium	(mg/L)	0.02	0.74	0.98	2.32	0.57	0.59
Selenium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	(mg/L)	0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001
Sodium	(mg/L)	0.5	5.3	4.5	8.8	4.7	4.9
Vanadium	(mg/L)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	(mg/L)	0.005	0.280	0.269	1.85	0.357	0.675

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 18, 2006
		Page:	3 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10850	S2006-10851	S2006-10852	S2006-10853	S2006-10854
Sample ID			Tail-SW11	Dup D	RMM-MW1	RMM-MW2	RMM-MW3
Date Collected			12-Sep-06	12-Sep-06	13-Sep-06	13-Sep-06	13-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	0.448	0.579	648	2.57	14.6
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	0.004	<0.001	0.004	<0.001	<0.001
Barium	(mg/L)	0.001	0.006	0.005	0.001	0.019	0.011
Berylium	(mg/L)	0.001	<0.001	<0.001	0.001	<0.001	0.001
Cadmium	(mg/L)	0.000015	0.000343	0.000864	0.432	0.000399	0.074637
Calcium	(mg/L)	0.5	5.8	10.2	599	484	652
Chromium	(mg/L)	0.001	0.001	0.001	0.342	0.003	0.006
Cobalt	(mg/L)	0.001	0.006	0.014	3.79	0.158	0.475
Copper	(mg/L)	0.001	0.100	0.255	826	0.001	22.0
Iron	(mg/L)	0.01	2.42	3.98	5150	368	223
Lead	(mg/L)	0.002	<0.002	<0.002	0.072	0.017	0.010
Magnesium	(mg/L)	0.02	2.00	3.00	616	89.3	133
Manganese	(mg/L)	0.001	0.208	0.390	32.9	39.9	43.2
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002	0.003	<0.002	<0.002
Nickel	(mg/L)	0.001	0.003	0.006	0.269	0.088	0.342
Phosphorous	(mg/L)	0.02	<0.02	<0.02	62.1	0.30	0.27
Potassium	(mg/L)	0.02	0.43	0.57	0.59	16.3	2.42
Selenium	(mg/L)	0.001	<0.001	<0.001	0.006	<0.001	<0.001
Silver	(mg/L)	0.0001	<0.0001	<0.0001	0.0023	0.0015	0.0017
Sodium	(mg/L)	0.5	3.7	4.7	11.4	24.3	18.1
Vanadium	(mg/L)	0.005	<0.005	<0.005	0.341	0.008	0.010
Zinc	(mg/L)	0.005	0.139	0.364	152	12.1	31.2

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		Page:	4 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10855	S2006-10856	S2006-10857	S2006-10858	S2006-10859
Sample ID			RMM-MW4	RMM-MW5	RMM-MW6	Tail-MW1	Tail-MW2
Date Collected			13-Sep-06	13-Sep-06	13-Sep-06	12-Sep-06	12-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	0.088	1.63	0.133	6.66	0.067
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	<0.001	<0.001	<0.001	0.003	0.004
Barium	(mg/L)	0.001	0.035	0.032	0.035	0.036	0.068
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.00697	0.015117	0.000108	0.009061	0.000093
Calcium	(mg/L)	0.5	480	202	207	64.0	297
Chromium	(mg/L)	0.001	0.001	0.001	0.003	0.002	0.002
Cobalt	(mg/L)	0.001	0.049	0.066	0.023	0.173	0.056
Copper	(mg/L)	0.001	0.017	4.76	0.007	1.11	<0.001
Iron	(mg/L)	0.01	3.39	0.35	23.6	6.50	40.5
Lead	(mg/L)	0.002	<0.002	<0.002	0.003	<0.002	0.006
Magnesium	(mg/L)	0.02	37.6	36.6	38.6	14.6	52.9
Manganese	(mg/L)	0.001	12.6	14.4	26.7	13.1	55.9
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.026	0.117	0.013	0.088	0.014
Phosphorous	(mg/L)	0.02	<0.02	0.04	0.04	0.02	0.07
Potassium	(mg/L)	0.02	10.0	10.8	9.29	2.39	40.5
Selenium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	(mg/L)	0.0001	0.0004	0.0004	0.0011	0.0005	0.0021
Sodium	(mg/L)	0.5	14.6	16.2	10.8	5.7	15.0
Vanadium	(mg/L)	0.005	<0.005	<0.005	0.005	<0.005	0.012
Zinc	(mg/L)	0.005	1.71	4.40	0.415	1.75	0.186

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		Page:	5 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10860	S2006-10861	S2006-10862	S2006-10863	S2006-10864
Sample ID			Tail-MW3	MW1	MW3	MW4	LRP-SW1
Date Collected			12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06	12-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	2.28	0.011	21.0	0.173	0.282
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	<0.001	<0.001	<0.001	0.006	0.003
Barium	(mg/L)	0.001	0.040	0.039	0.004	0.018	0.006
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.000141	0.000061	0.011698	0.002174	0.000032
Calcium	(mg/L)	0.5	51.4	95.5	173	214	2.0
Chromium	(mg/L)	0.001	0.030	<0.001	0.049	0.002	0.001
Cobalt	(mg/L)	0.001	0.006	0.001	0.216	0.080	<0.001
Copper	(mg/L)	0.001	0.055	0.004	2.36	0.021	0.003
Iron	(mg/L)	0.01	4.17	1.19	113	230	0.660
Lead	(mg/L)	0.002	<0.002	<0.002	0.025	0.011	<0.002
Magnesium	(mg/L)	0.02	6.30	5.69	64.5	31.2	0.73
Manganese	(mg/L)	0.001	1.18	1.64	13.2	12.6	0.022
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	0.005	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.015	<0.001	0.152	0.033	0.001
Phosphorous	(mg/L)	0.02	0.04	<0.02	0.18	0.22	0.02
Potassium	(mg/L)	0.02	4.30	3.64	5.86	23.3	0.25
Selenium	(mg/L)	0.001	0.001	0.001	0.005	0.003	<0.001
Silver	(mg/L)	0.0001	<0.0001	<0.0001	0.0007	0.0006	<0.0001
Sodium	(mg/L)	0.5	18.3	10.1	12.6	53.9	2.5
Vanadium	(mg/L)	0.005	0.009	<0.005	0.020	<0.005	<0.005
Zinc	(mg/L)	0.005	0.018	<0.005	4.37	0.976	<0.005

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		Page:	6 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10865	S2006-10866	S2006-10867	S2006-10868	S2006-10869
Sample ID			LRP-SW2	LRP-SW3	RPF-MW1	BRP-SW1	BRP-SW2
Date Collected			12-Sep-06	12-Sep-06	13-Sep-06	12-Sep-06	12-Sep-06
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	0.288	0.299	23.2	0.369	0.653
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	(mg/L)	0.001	0.006	0.006	0.020	0.005	0.004
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.000022	0.000064	0.037416	0.000051	0.000061
Calcium	(mg/L)	0.5	1.6	1.6	176	1.4	2.8
Chromium	(mg/L)	0.001	0.001	0.001	0.002	0.002	0.004
Cobalt	(mg/L)	0.001	<0.001	<0.001	0.951	0.004	0.010
Copper	(mg/L)	0.001	0.003	0.003	3.96	0.066	0.195
Iron	(mg/L)	0.01	0.62	0.62	3.39	1.00	1.33
Lead	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Magnesium	(mg/L)	0.02	0.68	0.67	57.4	0.90	1.27
Manganese	(mg/L)	0.001	0.019	0.019	19.3	0.059	0.131
Mercury	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.001	0.001	0.466	0.003	0.006
Phosphorous	(mg/L)	0.02	<0.02	<0.02	0.03	<0.02	<0.02
Potassium	(mg/L)	0.02	0.21	0.21	9.35	0.23	0.26
Selenium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	(mg/L)	0.0001	<0.0001	<0.0001	0.0011	<0.0001	<0.0001
Sodium	(mg/L)	0.5	2.4	2.4	10.8	2.4	2.9
Vanadium	(mg/L)	0.005	<0.005	<0.005	0.005	<0.005	<0.005
Zinc	(mg/L)	0.005	<0.005	<0.005	2.45	0.008	0.021

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		Page:	7 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab # / Sample ID / Date Collected			S2006-10870 Dup E 12-Sep-06	Lab Blank	Q.C. Standard Actual	Q.C. Standard Expected	Date of Analysis
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	6.20	<0.001	1.00	1.00	26-Sep-06
Antimony	(mg/L)	0.001	<0.001	<0.001	0.003	0.003	**
Arsenic	(mg/L)	0.001	<0.001	<0.001	0.003	0.003	**
Barium	(mg/L)	0.001	0.036	<0.001	0.54	0.50	26-Sep-06
Berylium	(mg/L)	0.001	<0.001	<0.001	0.54	0.50	26-Sep-06
Cadmium	(mg/L)	0.000015	0.008809	<0.000015	0.52	0.50	26-Sep-06
Calcium	(mg/L)	0.5	68.2	<0.5	10.4	10.0	26-Sep-06
Chromium	(mg/L)	0.001	0.002	<0.001	0.52	0.50	26-Sep-06
Cobalt	(mg/L)	0.001	0.157	<0.001	0.55	0.50	26-Sep-06
Copper	(mg/L)	0.001	1.14	<0.001	1.05	1.00	26-Sep-06
Iron	(mg/L)	0.01	3.04	<0.01	1.06	1.00	26-Sep-06
Lead	(mg/L)	0.002	<0.002	<0.002	1.05	1.00	26-Sep-06
Magnesium	(mg/L)	0.02	14.3	<0.02	4.01	4.00	26-Sep-06
Manganese	(mg/L)	0.001	10.9	<0.001	0.55	0.50	26-Sep-06
Mercury	(mg/L)	0.0001	<0.0001 (<0.0001)	<0.0001	0.002	0.002	19-Oct-06
Molybdenum	(mg/L)	0.002	<0.002	<0.002	1.03	1.00	26-Sep-06
Nickel	(mg/L)	0.001	0.082	<0.001	1.05	1.00	26-Sep-06
Phosphorous	(mg/L)	0.02	0.02	<0.02	2.07	2.00	26-Sep-06
Potassium	(mg/L)	0.02	2.06	<0.02	18.8	20.0	26-Sep-06
Selenium	(mg/L)	0.001	<0.001	<0.001	0.004	0.003	***
Silver	(mg/L)	0.0001	0.0005	<0.0001	1.10	1.00	26-Sep-06
Sodium	(mg/L)	0.5	5.2	<0.5	20.2	20.0	26-Sep-06
Vanadium	(mg/L)	0.005	<0.005	<0.005	0.53	0.50	26-Sep-06
Zinc	(mg/L)	0.005	1.96	<0.005	0.53	0.50	26-Sep-06

Comment:

* Method Detection Limit
Value in (brackets) represents Lab Replicate
** Samples analyzed on September 25, 2006 and October 19, 2006
*** Samples analyzed on September 26, 2006 and October 19, 2006

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 2
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab #			S2006-10591	S2006-10592
Sample ID			RPF-SW1	RPF-SW2
Date Collected			06-Sep-06	06-Sep-06
Parameters	**Unit**	**MDL***		
Aluminum	(mg/L)	0.001	31.9	2.91
Antimony	(mg/L)	0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	0.605	0.004
Barium	(mg/L)	0.001	0.009	0.014
Berylium	(mg/L)	0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.009	0.006
Calcium	(mg/L)	0.5	133	146
Chromium	(mg/L)	0.001	0.043	0.001
Cobalt	(mg/L)	0.001	0.254	0.101
Copper	(mg/L)	0.001	1.45	0.220
Iron	(mg/L)	0.01	385	2.39
Lead	(mg/L)	0.002	0.039	0.019
Magnesium	(mg/L)	0.02	92.1	14.7
Manganese	(mg/L)	0.001	15.5	6.56
Mercury	(mg/L)	0.0001	0.0001	<0.0001
Molybdenum	(mg/L)	0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.140	0.040
Phosphorous	(mg/L)	0.02	0.36	0.03
Potassium	(mg/L)	0.02	6.98	13.3
Selenium	(mg/L)	0.001	0.003	<0.001
Silver	(mg/L)	0.0001	0.0008	0.0002
Sodium	(mg/L)	0.5	9.8	18.5
Vanadium	(mg/L)	0.005	0.033	<0.005
Zinc	(mg/L)	0.005	7.08	3.59

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		Page:	2 of 2
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

			Lab Blank	Q.C. Standard Actual	Q.C. Standard Expected	Date of Analysis
Parameters	**Unit**	**MDL***				
Aluminum	(mg/L)	0.001	<0.001	1.00	1.00	18-Sep-06
Antimony	(mg/L)	0.001	<0.001	0.003	0.003	20-Sep-06
Arsenic	(mg/L)	0.001	<0.001	0.003	0.003	21-Sep-06
Barium	(mg/L)	0.001	<0.001	0.52	0.50	18-Sep-06
Berylium	(mg/L)	0.001	<0.001	0.53	0.50	18-Sep-06
Cadmium	(mg/L)	0.000015	<0.000015	0.52	0.50	18-Sep-06
Calcium	(mg/L)	0.5	<0.5	10.5	10.0	18-Sep-06
Chromium	(mg/L)	0.001	<0.001	0.52	0.50	18-Sep-06
Cobalt	(mg/L)	0.001	<0.001	0.54	0.50	18-Sep-06
Copper	(mg/L)	0.001	<0.001	1.02	1.00	18-Sep-06
Iron	(mg/L)	0.01	<0.01	1.03	1.00	18-Sep-06
Lead	(mg/L)	0.002	<0.002	1.05	1.00	18-Sep-06
Magnesium	(mg/L)	0.02	<0.02	4.07	4.00	18-Sep-06
Manganese	(mg/L)	0.001	<0.001	0.54	0.50	18-Sep-06
Mercury	(mg/L)	0.0001	<0.0001	0.002	0.002	19-Sep-06
Molybdenum	(mg/L)	0.002	<0.002	1.01	1.00	18-Sep-06
Nickel	(mg/L)	0.001	<0.001	1.04	1.00	18-Sep-06
Phosphorous	(mg/L)	0.02	<0.02	2.04	2.00	18-Sep-06
Potassium	(mg/L)	0.02	<0.02	18.8	20.0	18-Sep-06
Selenium	(mg/L)	0.001	<0.001	0.003	0.003	18-Sep-06
Silver	(mg/L)	0.0001	<0.0001	1.09	1.00	18-Sep-06
Sodium	(mg/L)	0.5	<0.5	20.4	20.0	18-Sep-06
Vanadium	(mg/L)	0.005	<0.005	0.52	0.50	18-Sep-06
Zinc	(mg/L)	0.005	<0.005	0.53	0.50	18-Sep-06

Comment: * Method Detection Limit

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Suman Punani, C. Chem.
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CHEMIST

Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 03, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Lead

Parameter Method Detection Limit Unit			Total Lead 5 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10889	BH-TP1-SS2	11-Sep-06	6 (6)
S2006-10890	BH-TP2-SS1	11-Sep-06	34
S2006-10891	BH-TP3-SS1	11-Sep-06	8
S2006-10892	BH-TP4-SS1	11-Sep-06	<5
S2006-10893	BH-TP5-SS2	11-Sep-06	5
S2006-10894	BH-TP6-SS1	11-Sep-06	13
S2006-10895	BH-TP7-SS1	11-Sep-06	<5
S2006-10896	BH-TP8-SS1	11-Sep-06	29
S2006-10897	BH-TP9-SS2	11-Sep-06	6
S2006-10898	BH-TP10-SS2	11-Sep-06	<5
S2006-10900	BH-TP12-SS1	11-Sep-06	12
Lab Blank			<5
Q.C. Standard Actual (mg/L)			1.00
Q.C. Standard Expected (mg/L)			1.00
Date of Analysis			23-Sep-06

Comment: Value in (brackets) signifies Lab Replicate

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 22, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Lead

Parameter Method Detection Limit Unit			Total Lead 5 (ug/g)
Lab Number	Sample ID	Date Collected	
S2006-10598	RMM-TP5-SS1	07-Sep-06	81
S2006-10604	RMM-TP11-SS2	07-Sep-06	8
S2006-10607	RMM-TP14-SS1	07-Sep-06	241
S2006-10608	RMM-TP15-SS1	07-Sep-06	121
Lab Blank			<5
Q.C. Standard Actual (mg/L)			1.04
Q.C. Standard Expected (mg/L)			1.00
Date of Analysis			15-Sep-06

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 25, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Lead

Parameter Method Detection Limit Unit			Total Lead 5 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10617	RMM-TP21-SS3	08-Sep-06	17
S2006-10619	RMM-TP23-SS3	08-Sep-06	507
S2006-10620	RMM-TP24-SS1	08-Sep-06	13
Lab Blank			<5
Q.C. Standard Actual (mg/L)			1.04
Q.C. Standard Expected (mg/L)			1.00
Date of Analysis			15-Sep-06

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 18, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (mg/L)
Lab Number	Sample ID	Date Collected	
S2006-10840	TAIL-SW1	12-Sep-06	<0.001
S2006-10841	TAIL-SW2	12-Sep-06	<0.001
S2006-10842	TAIL-SW3	12-Sep-06	<0.001
S2006-10843	TAIL-SW4	12-Sep-06	<0.001
S2006-10844	TAIL-SW5	12-Sep-06	<0.001
S2006-10845	TAIL-SW6	12-Sep-06	<0.001
S2006-10846	TAIL-SW7	12-Sep-06	<0.001
S2006-10847	TAIL-SW8	12-Sep-06	<0.001
S2006-10848	TAIL-SW9	12-Sep-06	<0.001
S2006-10849	TAIL-SW10	12-Sep-06	<0.001
S2006-10850	TAIL-SW11	12-Sep-06	<0.001
S2006-10851	DUP-D	12-Sep-06	<0.001
S2006-10852	RMM-MW1	12-Sep-06	0.148
S2006-10853	RMM-MW2	13-Sep-06	0.002
S2006-10854	RMM-MW3	13-Sep-06	0.002
S2006-10855	RMM-MW4	13-Sep-06	0.002
S2006-10856	RMM-MW5	13-Sep-06	<0.001
S2006-10857	RMM-MW6	13-Sep-06	0.001
S2006-10858	TAIL-MW1	12-Sep-06	0.001
S2006-10859	TAIL-MW2	12-Sep-06	0.001
S2006-10860	TAIL-MW3	12-Sep-06	<0.001
S2006-10861	MW1	12-Sep-06	<0.001
S2006-10862	MW3	12-Sep-06	0.001
S2006-10863	MW4	12-Sep-06	0.018
S2006-10864	LRP-SW1	12-Sep-06	<0.001
S2006-10865	LRP-SW2	12-Sep-06	<0.001
S2006-10866	LRP-SW3	12-Sep-06	<0.001
S2006-10867	RPF-MW1	13-Sep-06	<0.001
S2006-10870	DUP E	12-Sep-06	0.001
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.30
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			21-Sep / 02-Oct-06

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Cynthia Ridge, C. Chem
Q.A./Q.C. Officer

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 21, 2006
		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10581	RPF-TP1-SS2	06-Sep-06	0.225
S2006-10582	RPF-TP2-SS4	06-Sep-06	7.88
S2006-10583	RPF-TP3-SS1	06-Sep-06	13.1
S2006-10584	RPF-TP4-SS1	06-Sep-06	12.3
S2006-10585	RPF-TP5-SS3	06-Sep-06	0.560
S2006-10586	RPF-TP6-SS1	06-Sep-06	0.348
S2006-10587	RPF-TP7-SS1	06-Sep-06	12.2
S2006-10588	RPF-TP8-SS3	06-Sep-06	0.22
S2006-10589	RPF-TP9-SS1	06-Sep-06	66.8
S2006-10590	RPF-SED1	06-Sep-06	31.4
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.13
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			14/19-Sep-06

Comment: Value in ppm (ug/g)

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1463
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10596	RMM-TP3-SS2	07-Sep-06	21.0
S2006-10598	RMM-TP5-SS1	07-Sep-06	0.629
S2006-10599	RMM-TP6-SS1	07-Sep-06	2.66
S2006-10600	RMM-TP7-SS2	07-Sep-06	0.034
S2006-10601	RMM-TP8-SS1	07-Sep-06	0.441
S2006-10602	RMM-TP9-SS1	07-Sep-06	0.579
S2006-10604	RMM-TP11-SS2	07-Sep-06	0.318
S2006-10606	RMM-TP13-SS2	07-Sep-06	0.264
S2006-10609	RMM-TP16-SS1	07-Sep-06	0.152
S2006-10610	DUP 4	07-Sep-06	0.260
S2006-10612	DUP 11	07-Sep-06	0.318
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.13
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			19-Sep-06

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10904	TAIL-TL1	11-Sep-06	0.016
S2006-10905	TAIL-TL2	11-Sep-06	0.017
S2006-10906	TAIL-TL3	11-Sep-06	0.012
S2006-10907	TAIL-TL4	11-Sep-06	0.012
S2006-10908	TAIL-SED1	12-Sep-06	0.193
S2006-10909	TAIL-SED2	12-Sep-06	0.266
S2006-10910	TAIL-SED3	12-Sep-06	0.086
S2006-10911	TAIL-SED4	12-Sep-06	0.061
S2006-10912	TAIL-SED5	12-Sep-06	0.505
S2006-10913	TAIL-SED6	12-Sep-06	11.4
S2006-10914	TAIL-SED7	12-Sep-06	0.086
S2006-10915	TAIL-SED8	12-Sep-06	0.052
S2006-10918	LRP-SED1	12-Sep-06	0.042
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.00
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			21-Sep-/04-Oct-06

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (mg/L)
Lab Number	Sample ID	Date Collected	
S2006-10591	RPF-SW1	06-Sep-06	0.003
S2006-10592	RPF-SW2	06-Sep-06	0.005
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.13
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			14-Sep-06

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1464
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Total Cyanide

Parameter Method Detection Limit Unit			Total Cyanide 0.001 (µg/g)
Lab Number	Sample ID	Date Collected	
S2006-10614	RMM-TP18-SS2	08-Sep-06	0.343
Lab Blank			<0.001
Q.C. Standard Actual (mg/L)			4.13
Q.C. Standard Expected (mg/L)			4.00
Date of Analysis			19-Sep-06

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1496
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Lab Number	Sample ID	Date Collected	pH
S2006-10904	TAIL-TL1	11-Sep-06	2.5 (2.5)
S2006-10905	TAIL-TL2	11-Sep-06	2.4
S2006-10906	TAIL-TL3	11-Sep-06	2.2
S2006-10907	TAIL-TL4	11-Sep-06	2.3
S2006-10908	TAIL-SED1	12-Sep-06	6.5
S2006-10909	TAIL-SED2	12-Sep-06	4.8
S2006-10910	TAIL-SED3	12-Sep-06	5.4
S2006-10911	TAIL-SED4	12-Sep-06	4.6 (4.6)
S2006-10912	TAIL-SED5	12-Sep-06	5.1
S2006-10913	TAIL-SED6	12-Sep-06	5.8
S2006-10914	TAIL-SED7	12-Sep-06	5.9 (5.9)
S2006-10915	TAIL-SED8	12-Sep-06	4.3
S2006-10916	Dup A	12-Sep-06	5.1
S2006-10917	BRP-SED1	12-Sep-06	4.6
S2006-10918	LRP-SED1	12-Sep-06	4.2
Lab Blank			6.3
Q.C. Standard Actual (mg/L)			6.0
Q.C. Standard Expected (mg/L)			6.0
Date of Analysis			22-Sep-06

Comment: Value in (brackets) signifies Lab Replicate

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		Page:	1 of 1
Project Name:	Rambler	Sample Type:	Soil
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Lab Number	Sample ID	Date Collected	pH
S2006-10585	RPF-TP5-SS3	06-Sep-06	4.8
S2006-10588	RPF-TP8-SS3	06-Sep-06	4.9
S2006-10590	RPF-SED1	06-Sep-06	5.3 (5.4)
Lab Blank			5.7
Q.C. Standard Actual (mg/L)			6.0
Q.C. Standard Expected (mg/L)			6.0
Date of Analysis			27-Sep-06

Comment: Value in (brackets) signifies Lab Replicate

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		Page:	1 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10840 TAIL - SW1 12-Sep-06	S2006-10841 TAIL - SW2 12-Sep-06	S2006-10842 TAIL - SW3 12-Sep-06	S2006-10843 TAIL - SW4 12-Sep-06	S2006-10844 TAIL - SW5 12-Sep-06
General Chemistry	**Unit**	**MDL***					
Ammonia as N	(mg/L)	0.01	0.03	0.03	0.02	0.04	0.02
Chloride	(mg/L)	0.1	4.2	4.2	4.1	2.9	5.2
Conductivity	(µS/cm)	5	1230	1250	1250	25	78
Fluoride	(mg/L)	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hardness as CaCO3	(mg/L)	0.3	273	266	269	7.7	24.1
Nitrate as N	(mg/L)	0.05	0.05	<0.05	<0.05	0.05	<0.05
Nitrite as N	(mg/L)	0.015	<0.015	<0.015	<0.015	<0.015	<0.015
pH		-	2.55	2.55	2.54	5.56	4.89
Phenols	(mg/L)	0.001	0.002	0.002	0.002	<0.001	0.009
Sulphate	(mg/L)	0.1	604	564	567	0.5	24.1
Total Alkalinity (CaCO3)	(mg/L)	5	<5	<5	<5	<5	<5
Total Dissolved Solids	(mg/L)	10	910	866	880	21	70
Total Suspended Solids	(mg/L)	2	6	2	5	<2	18
Metals							
Calcium	(mg/L)	0.5	55.8	54.9	55.6	1.9	5.6
Magnesium	(mg/L)	0.02	32.5	31.4	31.7	0.75	2.43
Potassium	(mg/L)	0.02	4.98	4.80	4.83	0.23	2.20
Sodium	(mg/L)	0.5	4.8	4.6	4.7	2.7	4.9
Ion Balance							
Cation Sum	(meq)		8.61	8.46	8.59	0.28	0.75
Anion Sum	(meq)		12.7	11.87	11.9	0.18	0.70
Ion Balance	(%)		-19.2	-16.8	-16.3	19.8	3.43

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 19, 2006
		Page:	2 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10845 TAIL - SW6 12-Sep-06	S2006-10846 TAIL - SW7 12-Sep-06	S2006-10847 TAIL - SW8 12-Sep-06	S2006-10848 TAIL - SW9 12-Sep-06	S2006-10849 TAIL - SW10 12-Sep-06
General Chemistry	**Unit**	**MDL***					
Ammonia as N	(mg/L)	0.01	0.08	0.60	<0.01	0.04	0.05
Chloride	(mg/L)	0.1	5.5	4.2	5.1	4.9 (5.0)	5.1
Conductivity	(µS/cm)	5	156	337	1040	131	152
Fluoride	(mg/L)	0.1	<0.1	<0.1	0.3	<0.1 (<0.1)	<0.1
Hardness as CaCO3	(mg/L)	0.3	46.9	93.7	301.9	39.0	42.6
Nitrate as N	(mg/L)	0.05	<0.05	<0.05	<0.05	<0.05 (<0.05)	<0.05
Nitrite as N	(mg/L)	0.015	<0.015	<0.015	<0.015	<0.015 (<0.015)	<0.015
pH		-	4.08	3.23	2.71	4.27	4.22
Phenols	(mg/L)	0.001	<0.001	<0.001	0.002	<0.001	<0.001
Sulphate	(mg/L)	0.1	61.8	125	302	48.5 (49.2)	57.8
Total Alkalinity (CaCO3)	(mg/L)	5	<5	<5	<5	<5	<5
Total Dissolved Solids	(mg/L)	10	107	180	758	98	99
Total Suspended Solids	(mg/L)	2	4	3	<2	5	6
Metals							
Calcium	(mg/L)	0.5	12.2	25.9	66.3	10.5	11.3
Magnesium	(mg/L)	0.02	3.99	7.04	33.1	3.11	3.49
Potassium	(mg/L)	0.02	0.74	0.98	2.32	0.57	0.59
Sodium	(mg/L)	0.5	5.3	4.5	6.9	4.7	4.8
Ion Balance							
Cation Sum	(meq)		1.27	2.68	8.42	1.05	1.14
Anion Sum	(meq)		1.44	2.72	6.44	1.15	1.35
Ion Balance	(%)		-6.42	-0.75	13.4	-4.31	-8.38

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 19, 2006
		Page:	3 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10850 TAIL - SW11 12-Sep-06	S2006-10851 DUP D 12-Sep-06	S2006-10852 RMM - MW1 12-Sep-06	S2006-10853 RMM - MW2 13-Sep-06	S2006-10854 RMM - MW3 13-Sep-06
General Chemistry	**Unit**	**MDL***					
Ammonia as N	(mg/L)	0.01	0.02	0.04	1.94 (2.07)	1.55	1.78
Chloride	(mg/L)	0.1	4.3	5.1	7.3	6.2	8.2
Conductivity	(µS/cm)	5	77	127	10800	2170	2760
Fluoride	(mg/L)	0.1	<0.1	<0.1	<1.0 **	1.2	1.5
Hardness as CaCO3	(mg/L)	0.3	22.8	37.8	4030	1580	2180
Nitrate as N	(mg/L)	0.05	0.05	<0.05	<1.0 **	<0.05	0.34
Nitrite as N	(mg/L)	0.015	<0.015	<0.015	<0.05	<0.015	<0.015
pH		-	4.35	4.22	2.06	4.45	4.39
Phenols	(mg/L)	0.001	<0.001	<0.001	0.006	0.001	0.002
Sulphate	(mg/L)	0.1	23.4	47.3	13700	1210	2870
Total Alkalinity (CaCO3)	(mg/L)	5	<5	<5	<5	<5	<5
Total Dissolved Solids	(mg/L)	10	64	89 (92)	4450	2860	3940
Total Suspended Solids	(mg/L)	2	2	4	466	6530	28000
Metals							
Calcium	(mg/L)	0.5	5.8	10.2	599	484	652
Magnesium	(mg/L)	0.02	2.00	3.00	616	89.3	113
Potassium	(mg/L)	0.02	0.43	0.57	0.59	16.3	2.42
Sodium	(mg/L)	0.5	3.7	4.7	11.4	24.3	18.1
Ion Balance							
Cation Sum	(meq)		0.67	1.03	89.7	33.0	44.4
Anion Sum	(meq)		0.61	1.13	285	25.5	60.1
Ion Balance	(%)		4.62	-4.38	-52.1	13.0	-15.0

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	October 19, 2006
		Page:	4 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10855 RMM - MW4 13-Sep-06	S2006-10856 RMM - MW5 13-Sep-06	S2006-10857 RMM - MW6 13-Sep-06	S2006-10858 TAIL - MW1 12-Sep-06	S2006-10859 TAIL - MW2 12-Sep-06
General Chemistry	**Unit**	**MDL***					
Ammonia as N	(mg/L)	0.01	1.03	0.03 (0.03)	0.52	0.75	1.70
Chloride	(mg/L)	0.1	6.5	5.5	2.3	6.0	6.8
Conductivity	(µS/cm)	5	1590	1080	1170	570	1420 (1400)
Fluoride	(mg/L)	0.1	0.1	0.3	0.1	0.2	<0.1
Hardness as CaCO3	(mg/L)	0.3	1350	655	676	220	960
Nitrate as N	(mg/L)	0.05	<0.05	0.78	0.40	0.16	<0.05
Nitrite as N	(mg/L)	0.015	<0.015	<0.015	<0.015	<0.015	<0.015
pH		-	6.01	4.58	5.91	4.06	5.77 (5.78)
Phenols	(mg/L)	0.001	<0.001	<0.001	0.005	<0.001	<0.001
Sulphate	(mg/L)	0.1	1490	770	838	350	1200
Total Alkalinity (CaCO3)	(mg/L)	5	100	<5	86	<5	63 (65)
Total Dissolved Solids	(mg/L)	10	1850	1100	1220	487	1650
Total Suspended Solids	(mg/L)	2	9630	778	12300	1820	5170
Metals							
Calcium	(mg/L)	0.5	480	202	207	64.0	297
Magnesium	(mg/L)	0.02	37.6	36.6	38.6	14.6	52.9
Potassium	(mg/L)	0.02	10.0	10.8	9.29	2.39	40.5
Sodium	(mg/L)	0.5	14.6	16.2	10.8	5.66	15.0
Ion Balance							
Cation Sum	(meq)		28.0	14.1	14.2	4.79	20.9
Anion Sum	(meq)		33.2	16.3	19.3	7.47	26.4
Ion Balance	(%)		-8.52	-7.32	-15.1	-21.9	-11.7

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		Page:	5 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10860 TAIL - MW3 12-Sep-06	S2006-10861 MW1 12-Sep-06	S2006-10862 MW3 12-Sep-06	S2006-10863 MW4 12-Sep-06	S2006-10864 ERP - SW1 12-Sep-06
General Chemistry	**Unit**	**MDL***					
Ammonia as N	(mg/L)	0.01	0.27	0.31	0.87	6.12	0.01
Chloride	(mg/L)	0.1	6.2	6.8 (6.9)	7.1	8.8	3.2
Conductivity	(µS/cm)	5	309	465	1760	1490	26
Fluoride	(mg/L)	0.1	<0.1	<0.1 (<0.1)	<0.1	<0.1	<0.1
Hardness as CaCO3	(mg/L)	0.3	154	262	698	663	7.9
Nitrate as N	(mg/L)	0.05	<0.05	0.10 (0.10)	<0.05	<0.05	<0.05
Nitrite as N	(mg/L)	0.015	0.079	<0.015 (<0.015)	<0.015	<0.015	<0.015
pH		-	6.73	6.91	2.75	4.65	5.71
Phenols	(mg/L)	0.001	<0.001	<0.001	0.001	<0.001	<0.001
Sulphate	(mg/L)	0.1	68.9	109 (109)	1160	1030	0.5
Total Alkalinity (CaCO3)	(mg/L)	5	124	173	<5	5	5
Total Dissolved Solids	(mg/L)	10	282	342	2030	1670	62
Total Suspended Solids	(mg/L)	2	5870	63	363	316	27
Metals							
Calcium	(mg/L)	0.5	51.4	95.5	173	214	2.0
Magnesium	(mg/L)	0.02	6.30	5.69	64.5	31.2	0.72
Potassium	(mg/L)	0.02	4.30	3.64	5.86	23.3	0.25
Sodium	(mg/L)	0.5	18.3	10.1	12.6	53.9	2.5
Ion Balance							
Cation Sum	(meq)		3.99	5.77	16.4	16.2	0.27
Anion Sum	(meq)		4.09	5.93	24.3	21.8	0.21
Ion Balance	(%)		-1.21	-1.33	-19.4	-14.6	13.9

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		Page:	6 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1493
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number Sample ID Date Collected			S2006-10865 LRP - SW2 12-Sep-06	S2006-10866 LRP - SW3 12-Sep-06	S2006-10867 RPF - MW1 13-Sep-06	S2006-10868 BRP - SW1 12-Sep-06	S2006-10869 BRP - SW2 12-Sep-06	S2006-10870 DUP E 12-Sep-06
General Chemistry	**Unit**	**MDL***						
Ammonia as N	(mg/L)	0.01	0.02	0.03	0.21	<0.01	<0.01	0.73
Chloride	(mg/L)	0.1	3.3	3.2	4.8	3.6	4.3	6.2
Conductivity	(µS/cm)	5	23	23	1110	33	41	618
Fluoride	(mg/L)	0.1	<0.1	<0.1	0.7	<0.1	<0.1	0.2
Hardness as CaCO3	(mg/L)	0.3	6.9	6.8	676	7.2	12.2	229
Nitrate as N	(mg/L)	0.05	<0.05	<0.05	0.36	<0.05	<0.05	0.05
Nitrite as N	(mg/L)	0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
pH		-	5.65	5.63	3.63	5.67	5.63	3.67
Phenols	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Sulphate	(mg/L)	0.1	0.4	0.4	835	3.7	7.1	348
Total Alkalinity (CaCO3)	(mg/L)	5	5	5	<5	5	5	<5
Total Dissolved Solids	(mg/L)	10	48	53	1260	87	56	513
Total Suspended Solids	(mg/L)	2	4	<2	72100	<2	5	247
Metals								
Calcium	(mg/L)	0.5	1.6	1.6	176	1.4	2.8	68.2
Magnesium	(mg/L)	0.02	0.68	0.67	57.4	0.90	1.27	14.3
Potassium	(mg/L)	0.02	0.21	0.21	9.35	0.23	0.26	2.06
Sodium	(mg/L)	0.5	2.4	2.4	10.8	2.4	2.9	5.2
Ion Balance								
Cation Sum	(meq)		0.25	0.24	14.5	0.25	0.37	5.08
Anion Sum	(meq)		0.20	0.20	17.6	0.28	0.37	7.42
Ion Balance	(%)		9.92	9.59	-9.71	-4.92	0.42-	-18.8

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		Page:	7 of 7
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry

			Lab Blank	Q.C. Standard Actual	Q.C. Standard Expected	Date of Analysis
Parameters	**Unit**	**MDL***				
Ammonia as N	(mg/L)	0.01	<0.01	0.39	0.40	20-Sep-06
Chloride	(mg/L)	0.1	<0.1	4.3	4.2	20/21-Sep-06
Conductivity	(µS/cm)	5	<5	101	100	20-Sep-06
Fluoride	(mg/L)	0.1	<0.1	1.8	1.8	20/21-Sep-06
Hardness as CaCO3	(mg/L)	0.3	<0.3	-	-	-
Nitrate as N	(mg/L)	0.05	<0.05	4.2	4.2	20/21-Sep-06
Nitrite as N	(mg/L)	0.015	<0.015	0.52	0.50	20/21-Sep-06
pH		-	7.86	6.02	6.00	20-Sep-06
Phenols	(mg/L)	0.001	<0.001	0.015	0.015	19-Oct-06
Sulphate	(mg/L)	0.1	<0.1	24.1	24.0	20/21-Sep-06
Total Alkalinity (CaCO3)	(mg/L)	5	<5	101	100	20-Sep-06
Total Dissolved Solids	(mg/L)	10	<10	496	500	27-Sep-06
Total Suspended Solids	(mg/L)	2	<2	100	100	26-Sep-06
Cation Balance	(meq)		-	-	-	-
Anion Balance	(meq)		-	-	-	-
Ion Balance	(%)		-	-	-	-
Metals						
Calcium	(mg/L)	0.5	<0.5	10.4	10.0	26-Sep-06
Magnesium	(mg/L)	0.02	<0.02	4.01	4.00	26-Sep-06
Potassium	(mg/L)	0.02	<0.02	18.8	20.0	26-Sep-06
Sodium	(mg/L)	0.5	<0.5	20.2	20.0	26-Sep-06

Comments:

* Method Detection Limit
Value in (brackets) signifies Lab Replicate
** **Higher MDL reported due to interferences**

Cynthia Ridge, C. Chem.
Q.A/Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

/trh

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 29, 2006
		Page:	1 of 2
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry + Ion Balance

Lab Number			S2006-10591	S2006-10592
Sample ID			RPF-SW1	RPF-SW2
Date Collected			06-Sep-06	06-Sep-06
General Chemistry	**Unit**	**MDL***		
Ammonia as N	(mg/L)	0.01	0.57	0.09
Chloride	(mg/L)	0.1	8.2	4.2
Conductivity	(µS/cm)	5	2300	960
Fluoride	(mg/L)	0.1	0.1	0.1
Hardness as CaCO3	(mg/L)	0.3	711	425
Nitrate as N	(mg/L)	0.05	<0.05	0.06
Nitrite as N	(mg/L)	0.015	<0.015	<0.015
pH			2.66	3.16
Phenols	(mg/L)	0.001	<0.001 (<0.001)	<0.001 (<0.001)
Sulphate	(mg/L)	0.1	1930	591
Total Alkalinity (CaCO3)	(mg/L)	5	<5	<5
Total Dissolved Solids	(mg/L)	10	2620	755
Total Suspended Solids	(mg/L)	2	482	3 (4)
Metals				
Calcium	(mg/L)	0.5	133	146
Magnesium	(mg/L)	0.02	92.1	14.7
Potassium	(mg/L)	0.02	6.98	13.3
Sodium	(mg/L)	0.5	9.8	18.5
Ion Balance				
Cation Sum	(meq)		35.5	9.77
Anion Sum	(meq)		40.4	11.1
Ion Balance	(%)		-6.50	-6.26

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	September 29, 2006
		Page:	2 of 2
Project Name:	Rambler	Sample Type:	Water
Project Number:	TF 6126508	Lab Ref.:	F2006-1462
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

General Chemistry

			Lab Blank	Q.C. Standard Actual	Q.C. Standard Expected	Date of Analysis
Parameters	**Unit**	**MDL***				
Ammonia as N	(mg/L)	0.01	<0.01	0.39	0.40	13-Sep-06
Chloride	(mg/L)	0.1	<0.1	4.3	4.2	12-Sep-06
Conductivity	(µS/cm)	5	<5	102	100	12-Sep-06
Fluoride	(mg/L)	0.1	<0.1	1.7	1.8	12-Sep-06
Hardness as CaCO3	(mg/L)	0.3	<0.3	-	-	-
Nitrate as N	(mg/L)	0.05	<0.05	4.0	4.2	12-Sep-06
Nitrite as N	(mg/L)	0.015	<0.015	0.51	0.50	12-Sep-06
pH			8.09	6.03	6.00	12-Sep-06
Phenols	(mg/L)	0.001	<0.001	0.016	0.015	25-Sep-06
Sulphate	(mg/L)	0.1	<0.1	23.5	24.0	12-Sep-06
Total Alkalinity (CaCO3)	(mg/L)	5	<5	100	100	12-Sep-06
Total Dissolved Solids	(mg/L)	10	<10	500	500	22-Sep-06
Total Suspended Solids	(mg/L)	2	<2	100	100	14-Sep-06
Cation Balance	(meq)		-	-	-	-
Anion Balance	(meq)		-	-	-	-
Ion Balance	(%)		-	-	-	-
Metals						
Calcium	(mg/L)	0.5	<0.5	10.5	10.0	18-Sep-06
Magnesium	(mg/L)	0.02	<0.02	4.07	4.00	18-Sep-06
Potassium	(mg/L)	0.02	<0.02	18.8	20.0	18-Sep-06
Sodium	(mg/L)	0.5	<0.5	20.4	20.0	18-Sep-06

Comments: * Method Detection Limit
Value in (brackets) signifies Lab Replicate

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Q.A/Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Report No.: 63743-IAS

AMEC Earth & Environmental Ltd
PO Box 13216, 133 Crosbie Road
St. John's NL A1B 4A5
Attn: Gary Warren
Job No.: TF6126508

October 12, 2006

Fax: 709.722.7353

Modified Acid-Base Accounting
Results based upon Sulfide

RPC ID	Client ID	TOC	Paste pH	Total Sulfur	Sulfate†	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
				%	%	%	Kg $CaCO_3$/tonne			
63743-01A	EM-WR1 Sept. 13/06	0.08	6.7	0.843	0.125	0.843	26.3	37.7	11.3	1.4
63743-01B	Duplicate	0.1	6.7	0.852	0.125	0.852	26.6	38.0	11.4	1.4
63743-02	EMR-WR1 Sept. 13/06	0.05	7.4	1.21	0.030	1.21	37.8	15.7	-22.1	0.4
63743-03	EMR-WR2 Sept. 13/06	0.08	4.7	7.50	0.120	7.50	234	-1.3	-236	0.0
63743-04	EMR-WR3 Sept. 13/06	0.05	6.7	0.577	0.168	0.577	18.0	18.2	0.1	1.0
63743-05	EMR-WR4 Sept. 13/06	< 0.05	6.9	0.122	0.032	0.122	3.8	1.5	-2.3	0.4
63743-06	TAIL-WR1 Sept. 13/06	< 0.05	7.6	0.027	0.029	0.027	0.8	5.6	4.7	6.6
63743-07	TAIL-WR2 Sept. 13/06	< 0.05	7.1	1.22	0.091	1.22	38.1	25.5	-12.7	0.7
63743-08	TAIL-WR3 Sept. 13/06	< 0.05	8.0	0.670	0.030	0.670	20.9	62.4	41.4	3.0
63743-09	TAIL-WR4 Sept. 13/06	< 0.05	7.6	2.74	0.019	2.74	85.6	15.8	-69.9	0.2
63743-10	MAR-WR1 Sept. 13/06	0.06	6.8	4.21	0.060	4.21	132	5.3	-126	0.0
63743-11	MAR-WR2 Sept. 13/06	< 0.05	7.1	0.232	0.057	0.232	7.3	25.0	17.8	3.5
63743-12	MAR-WR3 Sept. 13/06	0.07	6.6	1.70	0.147	1.70	53.1	9.8	-43.3	0.2
63743-13	MAR-WR4 Sept. 13/06	0.05	6.6	0.204	0.160	0.204	6.4	21.7	15.3	3.4
63743-14	AAR-WR1 Sept. 13/06	< 0.05	7.2	1.63	0.052	1.63	50.9	15.8	-35.1	0.3
63743-15	AAR-WR2 Sept. 13/06	< 0.05	7.2	1.37	0.065	1.37	42.8	7.4	-35.4	0.2
63743-16	AAR-WR3 Sept. 13/06	< 0.05	6.7	1.78	0.265	1.78	55.6	38.1	-17.5	0.7
63743-17	AAR-WR4 Sept. 13/06	< 0.05	6.8	0.074	0.041	0.074	2.3	1.8	-0.5	0.8
63743-18	BRP-WR1 Sept. 13/06	< 0.05	6.8	1.29	0.035	1.29	40.3	16.8	-23.5	0.4
63743-19	BRP-WR2 Sept. 13/06	< 0.05	6.8	1.13	0.073	1.13	35.3	2.7	-32.6	0.1
63743-20	BRP-WR3 Sept. 13/06	0.07	5.0	2.51	0.142	2.51	78.4	-0.3	-78.7	0.0
63743-21	BRP-WR4 Sept. 13/06	< 0.05	6.2	2.40	0.084	2.40	75.0	3.3	-71.7	0.0
63743-22	BRP-WR5 Sept. 13/06	< 0.05	6.0	0.407	0.198	0.407	12.7	-1.7	-14.4	-0.1
63743-23	BRP-WR6 Sept. 13/06	0.05	6.7	0.763	0.122	0.763	23.8	19.8	-4.0	0.8
63743-24	DUP 1 Sept. 13/06	< 0.05	7.2	0.837	0.037	0.837	26.2	3.1	-23.0	0.1
63743-25	DUP 2 Sept. 13/06	0.06	5.6	2.45	0.096	2.45	76.6	-1.0	-77.5	0.0

The modified acid/base accounting was determined by the Sobek method.
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer.

† Acid soluble, non-volatile sulfur species (sulfate).
Sulfide was determined by difference.

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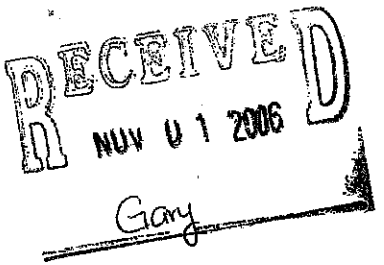

Modified Acid-Base Accounting
Results based upon Sulfide

RPC ID	Client ID	TOC	Paste pH	Total Sulfur	Sulfate†	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
				%	%	%	Kg $CaCO_3$/tonne			
63999-01	TAIL - TL1	0.11	2.2	23.0	1.17	21.8	682	-11.1	-693	-0.02
63999-02	TAIL - TL2	0.08	2.0	21.5	1.71	19.8	618	-11.6	-630	-0.02
63999-03	TAIL - TL4	0.17	2.0	12.4	3.27	9.13	285	-31.2	-316	-0.11

The modified acid/base accounting was determined by the Sobek method.
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer.

† Acid soluble, non-volatile sulfur species (sulfate).
Sulfide was determined by difference.

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Modified Acid-Base Accounting
Results based upon Sulfide

RPC ID	Client ID	TOC	Paste pH	Total Sulfur	Sulfate†	Sulfide	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
				%	%	%	Kg $CaCO_3$/tonne			
64018-01	TAIL - TL3	0.09	2.0	10.4	1.28	9.1	285	-12.3	-297	-0.04

The modified acid/base accounting was determined by the Sobek method.
A negative value for Net Neutralizing Potential indicates that the material is a net acid producer.

† Acid soluble, non-volatile sulfur species (sulfate).
Sulfide was determined by difference.

Ross Kean

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14.0 ASSESSOR'S QUALIFICATIONS

Key members of the project team and their qualifications are listed below.

Rod Winsor, M.Sc., P.Eng., Project Manager

Mr. Winsor has managed or conducted a wide range of environmental, geotechnical engineering, and geological/hydrogeological projects in Newfoundland and Labrador, Nova Scotia, New Brunswick, Labrador and the US working for private organizations and government agencies. Notably he has had significant field, reporting and management roles in recent ESAs conducted for Public Works and Government Services Canada, Department of Environment and Conservation, Department of Transportation & Works, Department of National Defense, Pennecon, M-I, L.L.C. and NLHC at four similar sites located in Stephenville, Goose Bay, Come by Chance, Hopedale, Buchans, West and Upper Salmon, and Northwest Point. Most environmental projects generally entailed the assessment and management of environmental liabilities and risks associated with compliance, hazardous materials and industrial chemicals, contamination of soil, sediment, groundwater, surface water, and indoor air by various chemical, physical, and biological agents. Major categories of work include various phases of Environmental Site Assessments, Environmental Remediation, Environmental Impact Studies, Indoor Air Quality and Sound Level Assessments, and Environmental Design. He has over 12 years experience practising as a consultant and project manager and has current US EPA HAZWOPER training. Mr. Winsor is a member of the Association of Professional Engineers and Geoscientists in NL.

Steve Sibbick, M.Sc., P.Geo., Senior Technical Specialist

Mr. Sibbick is a geochemist with over 17 years experience and specializes in mine closure assessment and planning, acid rock drainage (ARD) and mine waste geochemistry and management. He has managed numerous multidisciplinary geoscience and engineering projects related to mine closure, ARD assessment and the remediation of mines and mining related industrial sites. These include Phase I, II and III investigations of active and abandoned mine sites, and the development of remedial/closure plans to address contamination at these sites. Mr. Sibbick has conducted or managed environmental site investigations at approximately 50 mine sites across Canada, including the development and preparation of remedial/closure plans for over 35 of these sites. Key projects include the Britannia Mine in British Columbia, Tundra Mine in the Northwest Territories (NWT) and several historic coal mines in Cape Breton.

Gary Warren, M.A.Sc., Project Professional/Site Assessor

Mr. Warren has a Masters of Applied Science in Environmental Engineering from Memorial University of Newfoundland. He has over 6 years of experience conducting environmental investigations comprising Phase I, II and III site assessments, environmental audits and baseline studies for numerous sites. Most notably, Mr. Warren has also worked on several assessments and remediation projects for Public Works Government Services Centre (PWGSC), Defence Construction Canada (DCC), Transport Canada (TC) and the Department of Transportation and Works (DWT). Mr. Warren's experience also includes scheduling and coordination of field programs, site inspections for environmental assessment and legislative regulatory compliance, hazmat surveys, environmental sampling of the various media, sewage treatment feasibility studies, supervision of underground storage tank removal programs, waste audits, inventories of hazardous chemicals and other materials, and site supervision for the installation of monitoring wells, test pits, and for the excavation and disposal of contaminated soils. Mr. Warren has the current US EPA HAZWOPER training.

Kelly Curtis, CET, Site Assessor

Ms Curtis has a Diploma in Civil Engineering Technology from the College of the North Atlantic and is a member of the Association of Engineering Technicians and Technologists of Newfoundland and Labrador. She has 7 years of experience conducting environmental investigations comprising of Phase I, II and III environmental site assessments, remediation, hazmat surveys and site decommissioning projects and is familiar with all aspects of soil and groundwater sampling, as well as QA/QC protocols. Projects have included a wide spectrum of sites including, residential, commercial and industrial establishments. She is experienced in monitoring well installation, well development using hand and mechanized methods, test pit excavation, soil sampling, water sampling, sediment sampling, etc. Ms. Curtis has the current US EPA HAZWOPER training.

Sheldon Adey, CET, Site Assessor

Mr. Adey has a Bachelors Degree of in Environmental Technology from the University of Cape Breton. He has 7 years of experience conducting environmental investigations comprising of Phase I, II and III environmental site assessments, remediation and hazmat surveys and is familiar with all aspects of soil and groundwater sampling, as well as QA/QC protocols. Projects have included a wide spectrum of sites including, residential, commercial and industrial establishments. He is experienced in monitoring well installation, well development using hand and mechanized methods, test pit excavation, soil sampling, water sampling, sediment sampling, etc.. Mr. Adey has the current US EPA HAZWOPER training.

15.0 REFERENCES

- Davis Engineering and Associate Ltd. (DEAL), March 2005, Phase I Environmental Site Assessment, Former Rambler Mine Property, Baie Verte, NL.
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