

REPORT

Phase III ESA & Hazardous
Materials Assessment
Former Consolidated Rambler
Copper Mine, Baie Verte, NL

NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF NATURAL
RESOURCES - MINERAL
DEVELOPMENT DIVISION

REPORT NO. 1028976



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REPORT TO

**Alex Smith
Newfoundland & Labrador Department of
Natural Resources –
Mineral Development Division,
P.O. Box 8700, St. John's, NL A1B 4J6**

ON

**Phase III ESA & Hazardous Materials
Assessment, Former Consolidated Rambler
Copper Mine, Baie Verte, NL**

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EXECUTIVE SUMMARY

At the request of the Newfoundland and Labrador Department of Natural Resources - Mineral Development Division (DNR-MDD), Jacques Whitford Limited (Jacques Whitford) has carried out a Phase III Environmental Site Assessment (ESA) at the Former Consolidated Rambler Mine Property located off Highway 414, approximately 15 km east of the Town of Baie Verte, Newfoundland and Labrador (see Drawing No. 1028976-EE-01 in Appendix 1a). This work was carried out as a follow up to a Phase II ESA previously conducted on the property by AMEC Earth & Environmental (AMEC) in June 2006, and its purpose was to further delineate the noted environmental site impacts identified in the Phase II ESA (as reported in AMEC Report No. TF6126508 "*Phase II Environmental Site Assessment, Former Consolidated Rambler Mine Property, Baie Verte, Newfoundland and Labrador*", dated January 2007).

Based on a previous Phase I ESA conducted on the property in 2005 by Davis Engineering & Associates Ltd. (DEAL) ("*Phase I Environmental Site Assessment, Former Rambler Mine Property, Baie Verte, NL*", dated March 2005), the following six (6) smaller study areas were identified on the property for the purposes of subsequent environmental site investigations:

- 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.

Raymo Processing Facility Area – Phase III ESA

Fieldwork completed as part of the current investigation in the Raymo Processing Facility area comprised excavation of ten (10) test pits and installation of three (3) monitor wells.

The conclusions of this assessment are summarised below.

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised loose to dense brown to grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders overlying variably fractured grey to dark green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.3 m in test pit RP-TP4 (located in the former cyanide storage area) to greater than 4.57 m in monitor well RP-MW3 (located in the processing facility site area).
2. Groundwater was encountered at depths ranging from 1.8 m to 2.99 m below the ground surface in the monitor wells completed at this site. No groundwater seepage was encountered in any of the test pits completed at the site. Groundwater elevation data indicates shallow groundwater flow northwestward towards the Tailings Area in the northern portion of the processing facility area. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow in the southern portion of the processing facility area and the former cyanide drum storage area. However, based on local topography



and site observations the direction of groundwater flow is inferred to be southwards towards the low-lying, bog and wooded areas in these areas of the site.

3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA.
4. The concentration of total cyanide detected in soil at monitor well RP-MW1, located in the former cyanide drum storage area, exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg. Concentrations of total cyanide detected during the previous Phase II ESA 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 CCME criteria for free cyanide in soil at an industrial site of 8 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.
5. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of monitor well RP-MW1 and former test pit RPF-TP7 is approximately 150 m². Based on analytical evidence of impacts and the noted depth to bedrock (0.8 m) in this area, it is expected that approximately 120 m³ of impacted soil in the vicinity of monitor well RP-MW1 and former test pit RPF-TP7, exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
6. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of former test pit RPF-TP3, located in the former processing facility area is approximately 25 m². Vertical delineation of total cyanide impacts in soil have not been carried out in this area, and it is assumed that total cyanide impacts are present in the upper 1 m of soil in this area, and that approximately 25 m³ of impacted soil is present in the vicinity of former test pit RPF-TP3 that exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
7. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of former test pit RPF-TP4, located in the former processing facility area, is approximately 50 m². Based on analytical evidence of impacts and the noted depth to bedrock (0.6 m) in this area, it is expected that approximately 30 m³ of impacted soil in the vicinity of former test pit RPF-TP4, exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
8. Based on NLDEC policy directive PPD05-01, remediation of cyanide impacted soil at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach, remediation of cyanide impacted site soil would be governed by site-specific threshold limit criteria determined for this contaminant.

9. No concentrations of volatile organic compounds (VOCs), including toluene, were detected in the groundwater samples collected from RP-JW07-MW2 and RP-JW07-MW3 that exceeded the applicable Ontario Ministry of Environment (MOE) groundwater standards for these parameters. No concentrations of VOCs were detected in the groundwater sample collected from monitor well RPF-MW1.

East Mine – Phase III ESA

Based on testing completed as part of the Phase II ESA, no petroleum hydrocarbon, PCBs or PAHs impacts were identified in the East Mine Area. Therefore, no Phase III ESA activities were recommended for the East Mine Area in the Phase II ESA report, and no additional environmental site assessment work was carried out in this area as part of the current investigation

Tailings Area – Phase III ESA

No Phase III ESA activities were recommended for the Tailings area in the Phase II ESA report, and no further work was carried out during the Phase III ESA.

Rambler Main Mine Area – Phase III ESA

Fieldwork completed as part of the current investigation in the Rambler Main Mine area comprised excavation of seven (7) test pits and seven (7) monitor wells. The conclusions of this assessment are summarized below:

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised loose to dense brown grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders overlying variably fractured grey to dark green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.4 mbgs in test pit RM-TP8 to greater than 4.57 m in monitor well RM-MW9.
2. Groundwater was encountered at depths ranging from 0.49 m to 1.89 m below the ground surface in the test pits and monitor wells completed at this site. Based on site topography and site observations, the direction of regional groundwater flow at the site is inferred to be north towards England's Steady. However, groundwater elevation data indicates local radial shallow groundwater flow outwards from the mill building at the site, with groundwater flow direction determined to be toward the northeast in the vicinity of monitor wells RM-MW3, RM-MW4 and RM-MW5, towards the northwest in the vicinity of monitor well RM-MW6, and towards the southwest in the vicinity of monitor wells RM-MW7, RM-MW8 and RM-MW9.
3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA. However, during the current investigation, an oily sheen was observed on the surface of the groundwater in test pits RM-TP6 and RM-TP7, located on the west side of the mill building, and an oily residue was observed on the surface of bedrock in test pit RM-TP9, located in the fenced yard adjacent to the pad-mounted transformer, and on rock core recovered from monitor well RM-MW3, located adjacent to the generator and two 910 L ASTs present on the east side of the main mill building.
4. The detected TPH concentration in soil at test pits RM-TP6 and RM-TP7, located along the west side of the mill building exceeded the applicable Tier I RBSL for fuel oil on a commercial site with non-potable groundwater and coarse soil (i.e., 7,400 mg/kg). None of the detected concentrations of TPH in the other soil samples analyzed at the site during the current investigation exceeded the applicable Tier I RBSLs. Further, concentrations of BTEX in all soil samples analyzed were either non-detect or detected at levels below the applicable Tier I RBSLs for these parameters. The detected concentration of TPH in soil sample RMM-TP5-



SS1, collected adjacent to and down-gradient of the generator and two 910 L above ground storage tanks (ASTs) present on the east side of the main mill building during the Phase II ESA exceeded the applicable Tier I RBSL for a commercial site, returning a value of 12,200 mg/kg.

5. The estimated extent of TPH in soil exceeding the Tier I RBSLs for a commercial site in the vicinity of test pits RM-TP6 and RM-TP7, located along the west side of the mill building, is approximately 600 m². Based on field evidence of impacts and the noted depth to groundwater and bedrock in this area, it is expected that approximately 900 m³ of impacted soil in the vicinity of test pits RM-TP6 and RM-TP7 exceeds the applicable Tier I RBSL. Field and analytical evidence indicates that petroleum hydrocarbon impacts on average are present in the upper 1.5 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of petroleum hydrocarbon impacts in soil has been carried out the vicinity of test pits RM-TP6 and RM-TP7 and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates.
6. The estimated extent of TPH in soil exceeding the Tier I RBSLs for a commercial site in the vicinity of former test pit RMM-TP5 adjacent to and down-gradient of the generator and two 910 L ASTs present on the east side of the main mill building is approximately 72 m². Based on field evidence of impacts and the noted depth to groundwater and bedrock in this area, it is expected that approximately 94 m³ of impacted soil in the vicinity of former test pit RMM-TP5 exceeds the applicable Tier I RBSL. Field and analytical evidence indicates that petroleum hydrocarbon impacts are present in the upper 1.3 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of petroleum hydrocarbon impacts in soil have been carried out in this area and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates.
7. Based on NLDEC policy directive PPD05-01, remediation of petroleum hydrocarbon impacted soil at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach, remediation of petroleum hydrocarbon impacted site soil would be governed by site-specific threshold limit criteria determined for this contaminant.
8. The concentrations of total cyanide detected in soil at test pits RM-TP6, RM-TP7, and RM-TP8, located along the west side of the mill building, and soil at monitor well RM-MW5, located along the north side of the mill building, exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg. The concentration of total cyanide detected in soil at former test pit RMM-TP3, located along the west side of the main mill building in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, exceeded the CCME criteria for free cyanide in soil at an industrial site, returning a value of 21.0 mg/kg.
9. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, located along the west side of the mill building, is approximately 2,000 m². Based on analytical evidence of impacts and the noted depth to bedrock in this area, it is expected that approximately 1,400 m³ of impacted soil in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, exceeds the CCME criteria for free cyanide in soil on an industrial site. Analytical evidence indicates total cyanide impacts are present from surface to the base of the overburden layer in this area, which ranges in depth from 0.4 m to 1.8 m. An average depth of 0.7 m was assumed to estimate the impacted soil volume for this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of cyanide impacts in soil has been carried out the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, and the actual impacted area may be smaller

or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.

10. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of monitor well RM-MW5, located along the north side of the main mill building is approximately 100 m². Based on analytical evidence of impacts and the noted depth to bedrock in this area, it is expected that approximately 100 m³ of impacted soil in the vicinity of monitor well RM-MW5 exceeds the CCME criteria for free cyanide in soil on an industrial site. Vertical delineation of total cyanide impacts in soil have not been carried out in this area, and it is assumed that total cyanide impacts are present in the upper 1 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of cyanide impacts in soil has been carried out the vicinity of monitor well RM-MW5, and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
11. The detected concentration of total cyanide in groundwater from monitor well RM-MW7, located along the west side of the main mill building, exceeded the Ontario Ministry of Environment (MOE) standard for free cyanide in groundwater of 0.052 mg/L. The concentration of total cyanide detected in groundwater from former monitor well RMM-MW1 located in the northwest corner of the main mill building exceeded the assessment criteria of 0.052 mg/L during the Phase II ESA, returning a value of 0.146 mg/L.
12. The estimated extent of total cyanide in groundwater exceeding the CCME FAL criteria for free cyanide in the vicinity of monitor well RM-MW7, and former monitor well RMM-MW1 is approximately 2,450 m². Limited evaluation of cyanide impacts in groundwater have been carried out in this area, and additional delineation is required to confirm the extent of cyanide impacted groundwater in this area. The actual impacted area may be smaller or larger than the estimated area. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in groundwater in this area. It is possible that the extent of free cyanide impacts in groundwater in this area is less than that determined for total cyanide.
13. Based on NLDEC policy directive PPD05-01, remediation of cyanide impacted soil and groundwater at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach, remediation of cyanide impacted site soil and groundwater would be governed by site-specific threshold limit criteria determined for this contaminant.

Bunkhouse Area – Phase III ESA

Fieldwork completed as part of the current investigation in the Bunkhouse area comprised excavation of two (2) test pits and two (2) monitor wells. The conclusions of this assessment are summarised below.

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised comprised loose to dense grey brown sand and gravel till with varying percentages of clay, silt, and cobbles overlying greyish green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.3 mbgs in test pit RM-TP2 to 3.2 m in monitor well RM-MW2.



2. Groundwater was encountered at depths of 1.79 m and 1.92 m below the ground surface in monitor wells RM-MW1 and RM-MW2, respectively. No groundwater seepage was encountered in any of the test pits completed at the site. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow at the site. However, based on local topography and site observations, the direction of groundwater flow in the southern portion of the site is inferred to be southwards towards Rambler Brook and the direction of groundwater flow in the northern portion of the site is inferred to be northwards towards Englands Steady.
3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA.
4. Concentrations of petroleum hydrocarbons and PCBs in all soil samples and the concentration of petroleum hydrocarbons in all groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.

Recommendations – Phase III Environmental Site Assessment

The Phase III ESA investigation completed by Jacques Whitford was carried out as a follow up to a Phase II ESA previously conducted on the property by AMEC in 2006/2007, and its purpose was to further delineate the noted environmental site impacts identified during the Phase II ESA following the Phase III ESA sampling plan recommended in the Phase II ESA report. Jacques Whitford's Phase III ESA did not include further evaluation of various other contaminants identified on the property during the previous Phase II ESA, including metals and acid impacts in soil, groundwater, surface water, freshwater sediments and stockpiled tailings. Further, the former Consolidated Rambler Mine property is a large, complex site with a long history of industrial site usage, and it is possible that other environmental impacts are present on the site that have not been identified that may be discovered during decommissioning activities and may require future evaluation. Based on information provided by DNR-MDD, Jacques Whitford understands that a future limited industrial land use is intended for the Former Consolidated Rambler Mine Property.

Based on results of environmental site assessment work completed on the property to date, Jacques Whitford makes the following recommendations:

1. Decide whether to carry out conventional soil remediation (i.e., removal of impacted soil from the site for off-site disposal or treatment) or risk management (i.e., impacted soil is left in place and managed) or a combination of both approaches for petroleum hydrocarbon impacted soil identified in the Rambler Main Mine Area, and for cyanide impacted soil and groundwater identified in the Rambler Main Mine Area, and for cyanide impacted soil identified in the Raymo Processing Facility Area. Under a risk-management approach the site owner maintains the long-term liability for the impacts on the site.
2. Analytical results for total cyanide in soil and groundwater obtained during the current investigation and previous Phase II ESA provide conservative estimates of cyanide impacts in soil and groundwater on the property. Any future delineation of cyanide in soil and groundwater on the property should also involve species specific analysis of cyanide, including free cyanide, which may reduce area and volume estimates of cyanide impacted soil and groundwater provided in this report.
3. If the usage of a risk-management approach is acceptable to the site owner, carry out a human health risk assessment and a screening level ecological risk assessment for petroleum hydrocarbons and cyanide in the Rambler Main Mine Area, and for cyanide in the Raymo



Processing Facility Area. Dependent on the results of the screening level ecological risk assessment, additional ecological assessment could be required for portions of the property. Dependent on the results of the risk assessments, risk management or remedial action may be required for portions of the property.

4. Once the site owner makes a decision with respect to the future usage of the various portions of the property and whether to use a conventional remediation approach or a risk-management approach, develop a remedial action plan and/or a risk management plan for the study area. Submit the remedial action plan and/or risk management plan to the NLDEC for review and approval before implementing on the study area.
5. No additional work was carried out as part of the current investigation to further delineate the extent of metals impacts identified in soil in the East Mine Area, and in soil and groundwater in the Raymo Processing Area and Rambler Main Mine area during the Phase II ESA. The Phase II ESA indicates that metals impacts in soil are widespread throughout the site and likely reflect background geology conditions in the area. However, background soil sampling should be considered in order to provide metals chemistry results that are representative of natural conditions for comparison to evaluate the environmental significance of soil metals results from portions of property. In addition, background surface water and freshwater sediment sampling should be considered to evaluate the environmental significance of metals results for surface water and freshwater sediment samples collected from various sites on the property. Background metals sampling would also be required if a risk assessment/risk management approach is adopted for the property, as per Health Canada guidance.
6. In accordance with NLDEC policy directive PPD05-01, remediation of the metals impacted soil, freshwater sediment and surface water would be required unless a risk-based remedial approach is developed and approved for the property or the source of the metals impacts is shown to be natural in origin, demonstrated through background sampling.
7. No additional work was carried out as part of the current investigation to further evaluate levels of metals, cyanide and pH identified in sediment, and surface and groundwater in the Tailings Area during the Phase II ESA, as well as pH levels in soil, freshwater sediment and surface and groundwater in other portions of the property, as well as potential metals, cyanide and pH impacts along access roads with acid-generating rock cover materials. However, based on regulatory requirements, future environmental sampling for these parameters may be required in these areas. If an ecological risk assessment is to be conducted, detailed sampling of soil, sediment, and surface water and groundwater media for these parameters would likely be required.
8. All ASTs and USTs and associated pipelines identified at the site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
9. 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.

Recommendations – Hazardous Materials Assessment

The Hazardous Materials Assessment completed by Jacques Whitford was carried out as a follow up to a Phase II ESA previously conducted on the property by AMEC Earth & Environmental (AMEC) in June 2006, and its purpose was to carrying out a detailed inspection of the buildings, facilities and equipment at the site and documenting the location of known or suspected hazardous building materials. The hazardous materials assessment included an inspection for asbestos-containing materials,



lead/mercury/PCB-containing paints and materials, polychlorinated biphenyls (PCBs), mold and water-damaged building materials and any other hazardous materials observed in the subject buildings, facilities and equipment. The inspections and bulk sampling were carried out on a limited intrusive basis. Based on the results of the current investigation, Jacques Whitford makes the following recommendations:

1. Based on the results of the Phase II and III ESAs, friable asbestos building materials were confirmed to be present in some areas of the Former Consolidated Rambler Copper Mine. Non-friable asbestos was also confirmed to be present in some of the buildings on the site.
2. The management of asbestos-containing materials and the handling, removal and disposal of asbestos-containing materials from the buildings are to be carried out in accordance with the Newfoundland Asbestos Abatement Regulations 1998. An asbestos management action plan should be developed for the Former Consolidated Rambler Copper Mine to include options for the removal, management, handling and/or disposal of asbestos containing building materials.
3. Elevated lead concentrations (i.e., greater than 600 mg/kg) are present in paints throughout the Former Consolidated Rambler Copper Mine. Elevated mercury concentrations (i.e., greater than 10 mg/kg) are also present in paints throughout the Site.
4. Lead based paints and painted building materials that have a lead leachate concentration of less than the applicable assessment criterion of 5.0 mg/L may be disposed of at an approved landfill if removed from the Site. Mercury based paints and painted building materials that have a mercury leachate concentration of less than the applicable assessment criterion of 0.1 mg/L may also be disposed of at an approved landfill if removed from the Site. PCB based paints and painted building materials that have a PCB leachate concentration of less than the applicable assessment criterion of 0.3 mg/L may also be disposed of at an approved landfill if removed from the Site.
5. If the concentration of lead, mercury or PCB leachate in paints is at a level that is considered hazardous, the paint and painted building materials, if removed from the Site, must be disposed of as hazardous waste.
6. Lead, Mercury and PCB containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting.
7. Lead, Mercury and PCB based paints that are in poor condition may pose health concerns for building occupants or on-site workers. Lead, Mercury and PCB based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.
8. A management action plan for lead, mercury and PCB containing paints should be developed for the site.
9. The results of a limited inspection of light ballasts can be used to evaluate the presence of PCB ballasts in a building. If the apparently oldest ballasts on a floor of a building do not contain PCBs, then it is likely that none of the ballasts on the floor contain PCBs. If any of the inspected ballasts on a floor of a building contain PCBs, then all ballasts on that floor of the building must either be inspected or be treated as though they contain PCBs. Based on the available information and the observations from the limited inspections, it is possible that PCB-containing fluorescent light ballasts are located within the site buildings. It is recommended that all ballasts within the buildings



be inspected upon removal or be treated as though they contain PCBs. The removal and handling of the ballasts will have to be addressed as part of a remedial action plan for the site. This may include further inspection of ballasts prior to demolition if areas of site buildings are determined to be safe and/or the removal and handling of ballasts as part of demolition debris. Electrical equipment was observed on site and some equipment was empty of dielectric fluids and cores. In the event that the electrical equipment present at the Site is to be removed from the property, the dielectric fluids within the equipment (if present) must be tested for PCBs to assess transportation and disposal requirements. A management action plan for PCB containing electrical equipment should be developed for the site.

10. Various unidentified chemicals were present on the Rambler Main Mine Site including quantities of unknown chemicals, product samples and reagents. Chemical storage was observed or suspected within the Mill Building, the Chemical Laboratory, the Hoist Building and the Main Office. Before these buildings are renovated and/or demolished, a qualified contractor should conduct an inventory of the suspect chemicals. A management action plan for on-site chemicals should be developed to include options for the removal, disposal and/or management of the chemicals. The chemicals should be handled, removed and disposed of by a qualified contractor.
11. Extensive water damage and suspect mold growth was observed or suspected within some of the site buildings including the Main Office and the buildings in the Bunkhouse Area.
12. Qualified contractors experienced in the handling and disposal of hazardous building materials should complete any abatement of hazardous materials in accordance with applicable work procedures, guidelines, and/or regulations.

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1.0 INTRODUCTION

At the request of the Newfoundland and Labrador Department of Natural Resources - Mineral Development Division (DNR-MDD), Jacques Whitford Limited (Jacques Whitford) has carried out a Phase III Environmental Site Assessment (ESA) at the Former Consolidated Rambler Mine Property located off Highway 414, approximately 15 km east of the Town of Baie Verte, Newfoundland and Labrador (see Drawing No. 1028976-EE-01 in Appendix 1a). This work was carried out as a follow up to a Phase II ESA previously conducted on the property by AMEC Earth & Environmental (AMEC) in June 2006, and its purpose was to further delineate the noted environmental site impacts identified in the Phase II ESA (as reported in AMEC Report No. TF6126508 "*Phase II Environmental Site Assessment, Former Consolidated Rambler Mine Property, Baie Verte, Newfoundland and Labrador*", dated January 2007).

Based on a previous Phase I ESA conducted on the property in 2005 by Davis Engineering & Associates Ltd. (DEAL) ("*Phase I Environmental Site Assessment, Former Rambler Mine Property, Baie Verte, NL*", dated March 2005), the following six (6) smaller study areas were identified on the property for the purposes of subsequent environmental site investigations:

- 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.

The locations of these sites are shown on Drawing No. 1028976-EE-02 in Appendix 1a.

This report is presented in five sections. Section 1 provides background information about the property and an overview of previous environmental investigations completed on the property, explains the regulatory guidelines and their applicability, and describes the scope of work. Section 2 summarizes the methodology used for the Phase III ESA field investigation, hazardous materials assessment and laboratory analyses. Results of the Phase III ESA and hazardous materials assessment are presented in Section 3 by site; and include the results of field investigations, hazardous materials assessment and laboratory analyses, as well as a discussion of results and conclusions. Section 4 provides recommendations for future work on the property. Section 5 discusses the limitations of the assessment and its findings. Supporting information is provided in appendices by site. A discussion of remedial and risk management options to address identified issues on the site are provided under separate cover.

This report was prepared specifically and solely for the above project. The report presents all of the factual findings and laboratory results of the Phase III ESA investigations and hazardous materials assessment, and presents our comments on the environmental status of the property.



1.1 Property Description

1.1.1 Location and Access

The former Consolidated Rambler Mine is located on the Baie Verte Peninsula, approximately 15 km east of the Town of Baie Verte, NL (as shown on Drawing No. 1028976-EE-01 in Appendix 1a). The property is located along Highway Route 414, a paved secondary highway that connects to Highway Route 414 approximately 11 km to the east of the property. The property is bordered to the west and south by undeveloped land consisting primarily of wilderness and forested areas, to the east by undeveloped forested land and to the north by Highway Route 414, followed by an area currently under mining lease 141 (Ming Main Mine and Ming West Mine). Two main roads run north to south through the property, and access to various sites within the property is afforded via a network of gravel roads remaining from historical operations at the site; as shown on Drawing Nos. 1028976-EE-01 and 1028976-EE-02 in Appendix 1a, as well as the site plans provided in Appendices 2a to 6a.

1.1.2 Historical Development and Land Use

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, and ownership has since returned to the Crown.

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.

Currently the property is vacant, but contains various site buildings/foundations and infrastructure (i.e., equipment, roads, tailings stockpiles and excavated pits) related to former mining operations at the site.

1.1.3 Topography, Drainage, and Geology

The property is situated at an elevation of approximately 130 m above sea level and terrain on the property generally slopes gently to moderately toward the northeast. Ponds and brooks located in the site area are shown on Drawing Nos. 1028976-EE-01 and 1028976-EE-02 in Appendix 1a. Several large ponds are located on the property including Big Rambler Pond, Little Rambler Pond, Englands Steady, Mill Steady, Witness Stake Pond and Muskrat Pond. In addition, various surface drainage systems (i.e., ditches, culverts, etc.) are also present on the property to control surface water run-off.

Groundwater levels on the property are generally assumed to be close to ground surface and to be a subdued reflection of the topography. The direction of groundwater flow in the area is assumed to follow topography which would be towards the northwest draining into Baie Verte Harbour via South

Brook. However, based on groundwater elevation data collected as part of the current investigation, groundwater flow direction varies locally within the property, presumably following local topographic and site features. In addition, underground mine workings present on the property can be expected to influence groundwater flow conditions in the area.

Site-specific topography, surface drainage and groundwater flow conditions are discussed in more detail in Section 3. Surface water and groundwater on the property and within the general property area are not utilized as sources of drinking water.

Available geological maps and data indicate that the native bedrock is comprised of mafic and felsic volcanic rocks. The surficial geology in the area consists of sand and gravel till veneer. The characteristic permeability of these soils is moderate. However, much of the property is underlain by placed sand and gravel fill of variable thickness, and with varying percentages of silt, cobbles and boulders.

1.2 Previous Investigations

DEAL completed a Phase I ESA of the property in 2005 and AMEC completed a Phase II ESA on the property in 2006/2007. Details of the findings of the Phase I ESA are provided in the DEAL Phase I ESA report, dated March 2005, and are not included in this report. Details of the environmental site assessment work carried out and findings of the Phase II ESA by AMEC in 2006/2007 are discussed in more detail by site in Section 3. However, based on the findings of the Phase II ESA, the following overall conclusions were made with respect to the environmental status of the property:

1. Asbestos was detected in the drywall joint compound and exterior siding (west side) of Building No. 2 at the East Mine.
2. Lead-containing paints were detected at both the East Mine and the Raymo Processing Facility.
3. PCBs-containing oil residue was detected in a metal pan located inside the PCBs Storage Area of Building No. 2 at the East Mine.
4. Metal, cyanide and acid impacts in soil were detected at the Raymo Processing Facility; metal impacts in soil were detected at the East Mine; and petroleum hydrocarbon, metal and cyanide impacts in soil were detected at the Rambler Main Mine. Based on the testing completed, no PCBs or polycyclic aromatic hydrocarbons (PAHs) impacted soil was detected at the site during the Phase II ESA. No soil sampling was carried out at the Big Pond Rambler Mine during the Phase II ESA.
5. Toluene, metal and acid impacts were identified in groundwater at the Raymo Processing Facility; metals, cyanide, fluoride and acid impacts were identified in groundwater at the Rambler Main Mine; and metal, cyanide and acid impacts were identified in groundwater at the Tailings Area. No groundwater samples were collected at the East Mine, Big Pond Rambler Mine and the Bunkhouse Area during the Phase II ESA.
6. Metal and acid impacts were identified in all on-site water bodies sampled, including a value of pH (4.35) detected in surface water leaving the property (i.e., South Brook near Route 414), which was well below the applicable CCME Freshwater Aquatic Life (FAL) guideline of 6.5 to 9.0, indicating off-site migration of acidic waters from the property into the aquatic environment of South Brook and possibility other down-gradient freshwater and marine habitats.

7. Metal and acid impacts were detected in all on-site sediment samples during the Phase II ESA. Also, cyanide impacts were detected in sediment from the holding pond (i.e., vats) at the Raymo Processing Facility.
8. Site observations and testing completed during the Phase II ESA indicated the presence of potential acid generating (PAG) waste rock and tailings present throughout the site that are not buried or covered, but exposed to 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.

The Phase II ESA report recommended a Phase III ESA be conducted to further delineate various identified environmental impacts identified at the former mine site, and a Phase III sampling plan was provided in the Phase II ESA. Please note that at the time of the Phase II ESA, all buildings and structures on Mining Lease 145 (Rambler Main Mine and Bunkhouse Area) were not the property of the Crown and were excluded from the Phase II ESA.

1.3 Objectives and Scope

The objectives of the current Phase III ESA program at the former Consolidated Rambler Mine property as outlined in the project's RFP issued by the DNR-MDD, dated April 26, 2007 were as follows:

1. Conduct an investigation of the site using appropriate sampling methods to delineate the extent of contamination identified in the Phase II ESA report.
2. Prepare a hazardous materials assessment of all structures for materials not confirmed in the Phase II ESA report.
3. Provide a report that presents conclusions based on the scope of work and describes the chemical nature and the physical extent of the contamination and whether the contaminants of concern are present in excess of the appropriate criteria.
4. Provide a discussion of remediation options and cost estimates for each.

In order to meet the project objectives the following scope of work was developed based on review of the Phase I and II ESA reports for the mine site, the Phase III ESA sampling plan that was recommended in the Phase II ESA report, as well as site observations during a site visit by Jacques Whitford carried out on August 14, 2007 with DNR-MDD representative Mr. Alex Smith, P.Eng. The scope of work was designed to meet the requirements of the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) guidelines for the management of contaminated sites, as well as applicable hazardous materials regulations and associated occupational health and safety regulations.

Former Consolidated Rambler Mine - Raymo Processing Facility

Phase III ESA

- Drill two (2) boreholes and install monitor wells to investigate volatile organic compound (VOCs) impacts (in particular toluene) in soil and groundwater in the vicinity of monitor well RPF-MW1;
- Excavate five (5) additional test pits using an excavator to further delineate the vertical and horizontal extent of cyanide contaminated soil identified in test pits RPF-TP3 and RPF-TP4

during the Phase II ESA. Please note that this work was not recommended in the Phase II report.

- Excavate five (5) additional test pits using an excavator to delineate the vertical and horizontal extent of cyanide impacted soil at the former cyanide drum storage area. Please note that the locations of several test pits were selected to also evaluate the presence/absence of petroleum hydrocarbon and PCBs impacts in soil associated with scattered abandoned transformer-containing equipment debris not identified in the Phase I/II ESA reports but observed in the area during the site visit on August 14, 2007.
- Drill one (1) borehole and install a monitor well to investigate potential cyanide impacts in soil and groundwater down-gradient of the former cyanide drum storage area. Please note that this work was not recommended in the Phase II report.
- Collect soil samples from the test pits and borehole for required laboratory analysis;
- Collect water samples from the three (3) newly installed monitor wells, as well as from the existing monitor well RPF-MW1 for required laboratory analysis;
- Conduct a falling head test on select monitor wells to determine the permeability of the soil stratigraphy. Such information will be useful in evaluating remedial options or conducting a site-specific risk assessment on the property, if required;
- Submit select soil and groundwater samples for laboratory analysis of petroleum hydrocarbons, VOCs, cyanide and PCBs; and,
- Document the site investigation scope, methodology and results in a written report. The report will contain the results of the Phase III ESA. Dependent on the defined extent of the soil and groundwater impacts, the recommendations may be for criteria-based remediation, risk-based remediation or additional delineation. Where necessary and possible based on the amount of available site information, remedial action plans will be developed to address specific site issues.

Hazardous Materials Assessment

The following buildings were assessed as part of the Hazardous Materials Assessment:

- Rock Crushing equipment
- Storage Tower
- Partially enclosed structure housing electrical utilities

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment.

Former Consolidated Rambler Mine - East Mine Area

Phase III ESA

Based on testing completed as part of the Phase II ESA, no petroleum hydrocarbon, PCBs, or PAHs impacts were identified in the East Mine Area; and therefore, no Phase III ESA activities were recommended for the East Mine Area in the Phase II ESA report, and no further work was carried out during the Phase III ESA.



Hazardous Materials Assessment

The following buildings were assessed as part of the Hazardous Materials Assessment:

- Building No. 1
- Building No. 2

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interior of Building No. 1 was not accessed and the interior of Building No. 2 was not assessed entirely due to the poor structural condition of the buildings.

Former Consolidated Rambler Mine - Big Rambler Pond Mine

Phase III ESA

No Phase III ESA activities were recommended for the Big Rambler Pond Mine area in the Phase II ESA report, and no further work was carried out during the Phase III ESA.

Hazardous Materials Assessment

No buildings/structures are present in this area and no hazardous materials assessment was carried out during the Phase III ESA.

Former Consolidated Rambler Mine – Tailings Area

Phase III ESA

No Phase III ESA activities were recommended for the Tailings area in the Phase II ESA report, and no further work was carried out during the Phase III ESA.

Hazardous Materials Assessment

The following building was assessed as part of the Hazardous Materials Assessment:

- Monitoring Station

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site building, facilities and equipment.

Former Consolidated Rambler Mine – Rambler Main Mine Area

Phase III ESA

- Excavate two additional test pits using an excavator to further delineate the vertical and horizontal extent of petroleum hydrocarbon impacted soil identified adjacent to the generator and two 910 L aboveground storage tanks (ASTs) present on the east side of the mill building. Please note that the original work plan recommended four (4) test pits in this area. However, two of the test areas were replaced with monitor wells to allow for evaluation of potential groundwater impacts.
- Drill two (2) boreholes and install monitor wells to investigate potential petroleum hydrocarbon impacts and free phase petroleum hydrocarbon product in subsurface soil and groundwater adjacent to the generator and two 910 L ASTs present on the east side of the mill building. Please note that this work was not recommended in the Phase II report.

- Drill two (2) boreholes and install monitor wells to investigate potential petroleum hydrocarbon impacts and free phase petroleum hydrocarbon product in subsurface soil and groundwater in the vicinity of a north-flowing drainage ditch along the west side of the mill building where a strong odour of petroleum hydrocarbons was noted during the site visit on August 14, 2007. Please note that this work was not recommended in the Phase II report.
- Excavate three (3) additional test pits using an excavator to further delineate the vertical and horizontal extent of cyanide impacted soil identified along the west side of the mill building. Please note that the original work plan recommended four (4) test pits in this area. However, the location of one of the three recommended monitor wells to evaluate cyanide impacts in groundwater in the vicinity of RMM-MW1 has been selected to also serve in delineation of cyanide impacted soil identified along the west side of the mill building.
- Drill three (3) boreholes and install monitor wells to delineate the extent of cyanide impacted soil and groundwater in the vicinity of monitoring well RMM-MW1.
- Excavate two (2) additional test pits at the locations using an excavator to evaluate the petroleum hydrocarbons and PCBs impacts associated with recent transformer spills observed during the site visit on August 14, 2007 adjacent to a pad-mounted transformer along the access road to the site, and along the west side of the hoist room. Please note that this work was not recommended in the Phase II report.
- Collect soil samples from the test pits and boreholes for required laboratory analysis;
- Collect water samples from the five (5) newly installed monitor wells for required laboratory analysis;
- Conduct a falling head test on select monitor wells to determine the permeability of the soil stratigraphy. Such information will be useful in evaluating remedial options or conducting a site-specific risk assessment on the property, if required;
- Submit select soil and groundwater samples for laboratory analysis of TPH/BTEX, PCBs, and cyanide; and,
- Document the site investigation scope, methodology and results in a written report. The report will contain the results of the Phase III ESA. Dependent on the defined extent of the soil and groundwater impacts, the recommendations may be for criteria-based remediation, risk-based remediation or additional delineation. Where necessary and possible based on the amount of available site information, remedial action plans will be developed to address specific site issues.

Hazardous Materials Assessment

The following buildings were assessed as part of the Hazardous Materials Assessment:

- 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
- Storage Rack

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interiors of the Main Office, Chemistry Laboratory, Mill Building, Weigh Scales and the Storage Shed were not accessed due to either the poor structural condition of the buildings or suspect unsafe conditions due to unknown chemical storage.

Former Consolidated Rambler Mine – Bunkhouse Area (Mining Lease 145)

Phase III ESA

- Drill three (3) boreholes and install monitor wells to determine groundwater flow direction and investigate potential petroleum hydrocarbon impacts and free phase petroleum hydrocarbon product in subsurface soil and groundwater in the Bunkhouse Area of the site.
- Excavate two (2) additional test pits using an excavator to evaluate the petroleum hydrocarbons and PCBs impacts associated with recent transformer spills observed during the site visit on August 14, 2007 adjacent to Bunkhouse No. 2 and the Staff House. Please note that this work was not recommended in the Phase II report.
- Collect soil samples from the test pits and boreholes for required laboratory analysis;
- Collect water samples from the three (3) newly installed monitor wells for required laboratory analysis;
- Conduct a falling head test on select monitor wells to determine the permeability of the soil stratigraphy. Such information will be useful in evaluating remedial options or conducting a site-specific risk assessment on the property, if required;
- Submit select soil and groundwater samples for laboratory analysis of TPH/BTEX and PCBs; and,
- Document the site investigation scope, methodology and results in a written report. The report will contain the results of the Phase III ESA. Dependent on the defined extent of the soil and groundwater impacts, the recommendations may be for criteria-based remediation, risk-based remediation or additional delineation. Where necessary and possible based on the amount of available site information, remedial action plans will be developed to address specific site issues.

Hazardous Materials Assessment

The following buildings were assessed as part of the Hazardous Materials Assessment:

- Cookhouse
- 2 – Bunkhouses
- Staff Housing Unit



Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interiors of the buildings were not completely accessed due to the poor structural condition of the buildings.

Former Consolidated Rambler Mine – Acid Generating Access Roads

Phase III ESA

No Phase III ESA activities were recommended for the Acid Generating Access Roads in the Phase II ESA report, and no further work was carried out during the current Phase III ESA.

Hazardous Materials Assessment

No buildings/structures are present in this area.

1.4 Regulatory Framework

1.4.1 Soil & Groundwater

The former Consolidated Rambler Copper Mine site is presently not in active usage, however it is considered to be industrial based on past site operations and activities, and has been assessed during the current investigation for future industrial land use. Site soils are considered to be coarse-grained and groundwater resources are not used for human consumption and therefore considered to be non-potable.

The Newfoundland and Labrador Department of Environment and Conservation (NLDEC) adopted new soil and groundwater remediation guidelines for petroleum hydrocarbons on February 22, 2005 under policy directive PPD05-01. These guidelines are outlined in the *Guidance Document for the Management of Impacted Sites*, Version 1.0. The purpose of this guidance document is to provide a clear process for the management of impacted sites in Newfoundland and Labrador that result in the satisfactory resolution of environmental contamination, which may present an unacceptable risk to human health and ecological receptors. The guidance document incorporates recent scientific and regulatory advances in this area that have resulted from work at the international, national and regional levels.

The guidance document is based on a tiered approach to site management. Within this tiered approach, three tiers of increasing technical complexity (Tier I, II and III) are available for the management of impacted sites, all of which provide protection of human health and the environment to achieve the same result of safe site closure. The person responsible, with the assistance of the Site Professional, is able to choose Tier I, II or III depending on the specifics of the site, the contamination, the affected parties and the intended property use after closure. Tier I and II methods result in the selection of clean-up criteria that are protective of human health and the environment. Tier III may either result in the selection of clean-up criteria in the implementation of risk management techniques to reduce or eliminate exposure to the identified contaminants. As a result of this tiered approach, the clean-up criteria defined under the new guidance document are not as stringent as past guidelines and allow for greater flexibility in managing contaminated sites.

For a Tier I assessment, the guidance document and the Atlantic RBCA (Risk-Based Corrective Action) Version 2 User Guidance Document (August 2006) outline risk-based screening levels (RBSLs) for

evaluating petroleum hydrocarbon impacted sites. These criteria, contained in "Tier I RBSL Tables", are based on default conditions for typical sites and exposure pathways. These criteria are classified by receptor characteristics, groundwater usage and soil type. In addition, the TPH criteria are dependent on the nature of the hydrocarbon type (i.e., the criteria differ for gasoline, fuel oil and lube oil).

If site concentrations exceed the Tier I RBSLs, the site may be remediated to the Tier I RBSLs or a Tier II assessment may be completed to determine more appropriate clean-up criteria. A Tier II assessment may include comparison of the site concentrations to the Tier II Pathway-Specific Screening Level (PSSL) tables or development of Site-Specific Target Levels (SSTLs). PSSLs are only appropriate for sites where the exposure pathways assumed in the Tier I RBSL tables are not complete (e.g., if a property has no building on site, there would be no potential for on-site indoor air exposure).

In accordance with the Atlantic RBCA requirements, an "Ecological Receptor Screening Checklist" has been completed for the site and is provided in Appendix 1b. Further assessment of ecological receptors for petroleum hydrocarbon impacts and cyanide may be required in portions of the property, dependent on the remedial/risk management option selected for those portions of the property. In addition, further assessment of ecological receptors for various other contaminants identified on the property during the previous Phase II ESA, including metals and acid impacts in soil, groundwater, surface water, freshwater sediments and tailings may also be required in portions of the study area site, dependent on the remedial/risk management option selected for those portions of the study area as well as regulatory requirements.

The "Applicability of the Tier I/II RBSL/PSSL Tables" for the study area site was also completed and is provided in Appendix 1b. Based on the available site information and the existing and possible future site usage, petroleum hydrocarbons in soil and groundwater on the study area were screened against the Tier I RBSLs for fuel oil or lube oil on a commercial site with non-potable groundwater and coarse soil. Based on the existing and possible future site usage, PCBs, VOCs and cyanide in soil on the site were screened against industrial guidelines from the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (2007).

NLDEC policy directive PPD05-01 indicates that where groundwater is used as a source of drinking water, contaminants (other than TPH and BTEX) in the water should be remediated to the Canadian Drinking Water Quality Guidelines, and where groundwater is not used as a source of drinking water, contaminants (other than TPH and BTEX) in the water should be remediated to the relevant non-potable groundwater guidelines. Groundwater on the study area site and in the general site area is not utilized as a source of drinking water. There are no applicable Provincial or Federal regulatory guidelines for VOCs and cyanide in groundwater at an industrial non-potable site. In the absence of these, Jacques Whitford has utilized the Ontario Ministry of the Environment's (MOE) *Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act* (March 2004) for a full depth generic site with non-potable groundwater (Table 3). The MOE groundwater guidelines are protective against exposure from vapours that may migrate to indoor air, and protective for aquatic receptors in surface waters that could be affected by the discharge of groundwater. Jacques Whitford has applied the MOE groundwater standards to other environmental investigations where no applicable provincial or federal guidelines exist, and has obtained regulatory acceptance.

Please note that during the current investigation and previous Phase II ESA, laboratory analytical results for cyanide in soil and groundwater are reported as total cyanide (i.e., all free cyanide, all weak acid dissociable (WAD) cyanide complexes and all strong metal cyanides), while the applicable



guidelines for this compound in soil and groundwater refer specifically to free cyanide (i.e., only uncomplexed cyanide ion (CN⁻) and gaseous or aqueous hydrogen cyanide (HCN), which are the most toxic and mobile species of this compound. A comparison of total cyanide concentrations with guidelines for free cyanide is considered conservative, and may over estimate the extent of cyanide impacts in soil and groundwater identified on the property. However, it is considered appropriate at the present time, given the current lack of understanding of soil and groundwater geochemical conditions (i.e., pH, Eh, temperature, presence of other ions, etc.) in the cyanide impacted portions of the property and the ability of various complexed cyanide species to dissociate into free cyanides under various geochemical conditions.

1.4.2 Asbestos-Containing Materials

The inhalation of asbestos fibres can cause serious diseases of the lungs and other organs that may not appear until years after the exposure has occurred.

The common use of friable asbestos-containing materials (ACMs) in construction generally ceased voluntarily in the mid 1970s. If sampling indicates that asbestos is present in any concentration the product should be considered as asbestos-containing and dealt with accordingly. In addition, other ACMs are still known to be present in non-friable building materials currently used in the construction of buildings.

Friable ACMs (i.e., those which crumbles easily by hand pressure) are a potential health concern as asbestos fibres can be easily exposed and become airborne. Further, non-friable ACMs can be considered friable if disturbed. The investigation and management of asbestos-containing materials is governed by provincial regulations.

Asbestos sample analyses results were compared to the "1998 Newfoundland and Labrador Asbestos Abatement Regulations (NL 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.

1.4.3 Lead in Paint

In 1976, the lead content in interior paint was limited to 0.5% by weight (i.e., 5,000 mg/kg) under the federal Hazardous Products Act. A recent change to the Surface Coating Materials Regulations (April 2005) under the Hazardous Products Act indicates that the total lead present in a surface coating material (i.e., paint) must not be more than 0.06% by weight (600 mg/kg).

Jacques Whitford is not aware of specific Federal or Provincial regulations with respect to remediation of lead-based paints or disposal of removed lead-based paints. However, provisions of the Environment Protection Act or the Occupational Health and Safety Act may be used by the Occupational Health & Safety Division of the Department of Government Services to require that testing be carried out for lead in paints or for the leachability of lead-based paints, if such testing is considered to be warranted by the OH&S Division. In general, lead-based paints (i.e., lead content above 600 mg/kg) that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding or sandblasting.

The Newfoundland Department of Environment and Conservation (NLDEC) has not established specific regulations for the disposal of lead-based painted materials or removed lead-based paints (i.e., paints removed from the building materials) in a municipal landfill. NLDEC has adopted an informal criterion of 600 mg/kg for the disposal of lead-based painted construction debris in an approved municipal landfill. A leachability test (i.e., TCLP-1311 leachability test with lead analysed on the leachate) is warranted prior to disposal of removed paints if the tested lead concentration in the paint exceeds 600 mg/kg. If the lead content of the leachate exceeds 5 mg/L, the paint is leach toxic and considered to be a hazardous material (Environment Canada Table of Metals Leachate Toxicity for lead leachability). A leachability test is also warranted prior to disposal of demolition debris with intact paints if the calculated bulk lead concentration in the demolition debris (i.e., ratio of the mass of the paint per unit area and the mass of the painted building material per unit area times the concentration of lead in the paint sample) exceeds 600 mg/kg. If warranted, the leachability tests on painted demolition debris should be carried out on bulk samples of the demolition debris with the lead-based paints intact.

1.4.4 Mercury in Paint

A recent change to the Surface Coating Materials Regulations (April 2005) under the Hazardous Products Act indicates that the total mercury present in a surface coating material (i.e., paint) must not be more than 10 mg/kg.

For disposal of paint containing mercury, the level of mercury within the paint could also be compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (2007) industrial guidelines for mercury of 50 mg/kg.

A leachability test (i.e., TCLP-1311 leachability test with mercury analysed on the leachate) is warranted prior to disposal of removed paints if the tested mercury concentration in the paint exceeds 10 mg/kg. If the mercury content of the leachate exceeds 0.1 mg/L, the paint is leach toxic and considered to be a hazardous material (Environment Canada Table of Metals Leachate Toxicity for mercury leachability). A leachability test is also warranted prior to disposal of demolition debris with intact paints if the calculated bulk mercury concentration in the demolition debris (i.e., ratio of the mass of the paint per unit area and the mass of the painted building material per unit area times the concentration of mercury in the paint sample) exceeds 10 mg/kg. If warranted, the leachability tests on painted demolition debris should be carried out on bulk samples of the demolition debris with the mercury-based paints intact.

1.4.5 Polychlorinated Biphenyls in Paint

The CCME guidelines for PCB in soil at a commercial/industrial site (33.0 mg/kg) were 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 33.0 mg/kg should be subjected to leachability testing. The federal regulation for the Transportation of Dangerous Goods (TDG) for PCBs (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.

2.0 METHODOLOGY

2.1 Phase III Environmental Site Assessment

2.1.1 Field Investigation

The Phase III ESA investigation consisted of drilling boreholes, installing monitor wells, excavating test pits, and carrying out related soil and groundwater sampling and field testing during the period from September 4 to September 21, 2007. Fieldwork and site supervision was conducted by Steve Moores, a Jacques Whitford senior environmental technician. Drilling services were provided by Logan Geotech Inc. of Stewiacke, Nova Scotia. Excavator services were provided by Barker Construction of Baie Verte, NL. Table 1 provides a summary of fieldwork for the current investigation subdivided by individual sites.

Table 1 Summary Table of Phase III ESA Scope of Work – Former Consolidated Rambler Copper Mine

Site	Environmental Concern	Scope of Work	
		Test Pit	Monitor Well
Raymo Processing Area	Potential impacts related to historical storage and usage of petroleum hydrocarbons, VOCs and cyanide on site, as well as potential PCBs impacts related to disposal of transformer-containing equipment on site.	10	3
Rambler Main Mine Area	Potential impacts related to historical storage and usage of petroleum hydrocarbons and cyanide on site, as well as potential PCBs impacts related to spillage of dielectric fluids from former and existing transformers on site.	7	7
Bunkhouse Area	Potential impacts related to historical usage and possible spillage of petroleum hydrocarbons on site, as well as potential PCBs impacts related to spillage of dielectric fluids from existing transformers on site.	2	2
Total		19	12

As part of the current investigation, test pits and monitor wells were completed in the following areas of the property: 1) Raymo Processing Facility Area, 2) Rambler Main Area, and 3) Bunkhouse Area. Test pit and monitor well locations were selected by Jacques Whitford in consultation with DNR-MDD in target areas of concern. The locations of the test pits and monitor wells were established in the field by Jacques Whitford personnel by measurements from existing site infrastructure and by usage of a hand-held Garmin GPS unit. The GPS coordinates for the test pits and monitor wells are provided by site in Appendices 2e, 5e, and 6e. For each site, the elevations of the ground surface at the monitor wells were measured with respect to a benchmark of 100 m established at one of the monitor wells, as noted on the Monitor Well Records in Appendices 2b, 5b, and 6b. Sample location plans provided by site in Appendices 2a, 5a and 6a show the locations of test pits and monitor wells completed as part of the current investigation, as well as general site features and former Phase II ESA sample locations.

Groundwater

A total of twelve (12) boreholes were drilled using a track-mounted CME-85 and both hollow stem auger and wash boring drilling techniques, and were terminated at depths below ground surface ranging from 3.04 to 4.57 m.

A total of 19 test pits were excavated on the property using a Caterpillar 320 LC track-mounted excavator. The test pits were excavated to depths below ground surface ranging from 0.3 to 1.8 m, and were backfilled with excavated material upon completion.

Fieldwork was managed on a full time basis by Jacques Whitford personnel who kept detailed records of surface and subsurface conditions and recovered representative samples of the materials encountered. In the test pits, soils were sampled directly by bulk sample methods from the test pit walls or from the excavator bucket. Soil samples were recovered from the test pits at frequent intervals over their respective depths, the number of which varied with the test pit depth. In the test pits, where possible, one sample was collected near surface, one at maximum test pit depth and one additional sample per 0.5 to 1.5 m of depth. In the boreholes, where possible, soils were continuously sampled at 0.61-m intervals using a 50-mm diameter split-spoon sampler. Also, Standard Penetration Tests (SPT) were conducted on each borehole and N-values were recorded. Where bedrock was encountered in the boreholes, HQ-size core was recovered.

Following drilling, monitor wells were installed in all of the completed boreholes. The wells consisted of 50-mm diameter, flush-threaded, Schedule 40 PVC casing and No. 10 slot screen. Silica sand was placed around the screened section to inhibit silt intrusion into the well and facilitate well development. The screened section was placed to span the water table as measured at the time of drilling. A bentonite seal was placed above the sand pack, followed by backfill with drill cuttings to the surface. Details of subsurface conditions encountered at the test pit and borehole locations, as well as specific monitor well construction details are presented on the Test Pit and Monitor Well Records provided by site in Appendices 2b, 5b and 6b.

The soil samples were examined for any field evidence of petroleum hydrocarbon impacts. Duplicate soil samples were collected at each sample location, where possible. The samples were placed in clean glass jars with aluminum foil under the lids. Head space soil vapour concentrations were measured in the duplicate sample jars using a MiniRAE 2000 photoionization detector (PID). These PID readings are presented on the Test Pit and Monitor Well Records by site in Appendices 2b, 5b and 6b. Based on the PID readings, site observations and site history, selected soil samples were submitted to Maxxam Analytics Inc. in St. John's, NL, and Bedford, NS, for required laboratory analysis.

Upon completion of the monitor wells, each monitor well was developed using a dedicated Waterra inertia pump apparatus with Waterra tubing and PVC foot valves. Prior to groundwater sampling, the water level was measured in each monitor well and the well was purged by removing a minimum of three well volumes of water. Following monitor well development, groundwater samples were collected into clean, new sample bottles and submitted to Maxxam Analytics Inc. in St. John's, NL and Bedford, NS for required laboratory analysis. Please note that Jacques Whitford had to return to the site on October 23, 2007 to recollect groundwater samples for cyanide due to an error by the laboratory in preparation of the original samples.

Groundwater elevations in the monitor wells were determined by subtracting the depth to groundwater from the ground surface elevation. Then, where groundwater elevation data was available from a minimum of three monitor wells, the direction of groundwater flow was determined using three point triangulation.

A hydraulic response (bail-down) test was carried out on one monitor well, RM-MW7, installed in the Rambler Main Mine area to determine the permeability of the underlying stratigraphy at the site. While bail down testing was only performed on one monitor well on the property due to time constraints in the field, test results are considered to provide a reasonable estimate of the permeability of the uppermost (i.e., water table) aquifer on the property. The bail down test was conducted by removing a volume of water from the well and recording the water level in the well at specific time intervals as the water level recovered. Results of bail-down testing are provided in Appendix 5f. The permeability data collected as part of this investigation would be necessary to carry out human health and ecological risk assessments at the site, if required in the future.

2.2 Hazardous Materials Assessment

Jacques Whitford completed the Hazardous Materials Assessment by carrying out a detailed inspection of the buildings, facilities and equipment at the site and documenting the location of known or suspected hazardous building materials.

The hazardous materials assessment included an inspection for asbestos-containing materials, lead/mercury/PCB-containing paints and materials, polychlorinated biphenyls (PCBs), mold and water-damaged building materials, urea formaldehyde foam insulation (UFFI), mercury and any other hazardous materials observed in the subject buildings, facilities and equipment. The inspections and bulk sampling were carried out on a limited intrusive basis.

2.2.1 Asbestos Assessment

The following describes the scope of work and methodology for the asbestos assessment:

1. Carried out an asbestos assessment of the buildings, equipment and facilities as required under Section 10 of the Newfoundland and Labrador Asbestos Abatement Regulations, 1998; the assessment documented the location, condition and approximate quantity of asbestos containing materials (ACMs) throughout the buildings; JW inspected all safely accessible building materials, equipment and insulation for the presence of asbestos; suspended ceiling tiles (if any) were lifted to enable an inspection above ceilings; samples of vinyl floor tiles, ceiling tiles, pipe insulation/parging, drywall materials and joint compounds, hardboards, plaster finishes and stuccos were collected (if present); bulk samples were collected and analysed where necessary to confirm the asbestos content; where possible, visual similarity between materials in each individual room of the buildings was used to reduce the number of samples which require analysis in other rooms in the buildings; potential ACMs not identified as visually similar to materials identified in other rooms in the buildings were sampled accordingly;
2. Jacques Whitford attempted to correlate in the field the locations of the previous asbestos samples collected and analyzed during the Phase II ESA to minimize duplication and additional laboratory costs;
3. Visual inspections and sampling were limited to safely and readily accessible portions of the site buildings, facilities and equipment;
4. The sampling program included random sampling of drywall/drywall plasters and stuccos (if present) throughout the buildings; to limit costs, drywall/drywall plaster samples and stucco samples were not obtained from all rooms in the buildings; if the analytical results indicated the variable

presence of asbestos in drywall/drywall plasters or stuccos, then additional sampling may be required, or alternatively all drywall/drywall plasters and stuccos must be treated as ACMs during renovation/removal;

5. Materials and equipment were inspected and sampled on a limited intrusive basis where required (i.e., where there was evidence of possible concealed ACMs, Jacques Whitford opened equipment, walls or ceilings to search for possible ACMs as required); Jacques Whitford did not inspect all concealed spaces throughout the buildings; Jacques Whitford minimized any damage caused during inspection and sampling, but Jacques Whitford did not repair any damages caused to building finishes during the inspection and sampling; Jacques Whitford accessed and inspected for concealed flooring in one location per room, for all rooms which may have multiple layers of flooring visible;
6. The asbestos assessment included approximate quantification of the amount of ACMs present in the various areas of the buildings; Jacques Whitford physically inspected pipe and fitting insulation on any exposed pipelines (if encountered) in the buildings;
7. Documented the asbestos assessment in a report; the report includes floor plan sketches showing bulk sample locations;
8. Jacques Whitford's scope of work did not include the preparation of an Asbestos Management Plan or the preparation of site-specific specifications or tender documents for the removal of ACMs; and,
9. The asbestos assessment did not include sampling and testing of air in the buildings or on exterior areas of the site. Air quality monitoring can be conducted during future removal of ACMs.

2.2.2 Paint Assessment

The following describes the scope of work and methodology for the paint assessment:

1. Carried out a representative assessment for lead/mercury/PCB-based paint materials throughout the buildings, facilities and equipment; the assessment documented the location and condition of lead/mercury/PCB-based paint throughout the buildings; Jacques Whitford inspected all exterior and interior painted surfaces; representative bulk samples were collected and analyzed where necessary to confirm lead/mercury/PCB content; where possible, visual similarity between painted surfaces in each individual room was used to reduce the number of samples which require analysis in other rooms; samples were collected of the paints that are most common throughout the buildings – all paint colours were not sampled; the painted surface of a sample of equipment in the buildings or exterior to the buildings was included in the survey (not all equipment was sampled); based on the results of the assessment, the location and condition of lead/mercury/PCB -based materials was provided for the buildings;
2. Jacques Whitford attempted to correlate in the field the locations of the previous paint samples collected and analyzed during the Phase II ESA to minimize duplication and additional laboratory costs;
3. Visual inspections and sampling were limited to safely and readily accessible portions of the site buildings, facilities and equipment;
4. The locations, conditions and substrates were noted for all painted building materials;



5. Dependent on the lead and mercury concentrations in the tested samples (i.e., if the lead and mercury concentrations are above the allowable levels for disposal in a municipal landfill), testing for lead and mercury leachability was required to determine the acceptable disposal options for the painted materials;
6. The lead/mercury/PCBs assessment did not include sampling and testing of air in the building for the presence of lead/mercury/PCBs;
7. The report includes marked-up floor plan sketches to show the locations of bulk samples; and,
8. The scope of work did not include the generation of specifications or tender packages for the remediation of any identified lead/mercury/PCB -based paints.

2.2.3 PCBs Inspection Program

The following describes the scope of work and methodology for the PCBs assessment:

1. A general PCB assessment was conducted in the buildings to identify the type and location of possible PCB-containing equipment such as fluorescent light ballasts or transformers; based on the age of the site construction, PCB-containing equipment could be present;
2. It should be noted that for demolition and disposal purposes in buildings which have a mixture of PCB ballasts and non-PCB ballasts, either all ballasts should be considered to contain PCBs or all ballasts should be checked individually for PCBs and disposed accordingly. The information obtained from each light ballast should be compared to information in the Environmental Protection Services report EPS 2/CC/2 Identification of Lamp Ballasts Containing PCBs to determine whether or not the ballasts contain PCBs;
3. Random inspection of observed fluorescent light ballasts that were easily accessible was included in the scope of work for this assessment; Jacques Whitford accessed and inspected a sample of the oldest looking ballasts in the buildings; all removed ballasts were put back in place; the report presents a list of all ballasts inspected and notes the ballasts that are known to contain PCBs, those that are known to be PCB-free, and those that are assumed to contain PCBs due to the absence of manufacturer's date codes and/or markings;
4. Jacques Whitford identified any transformers present on exterior areas or present in the interior of the buildings. Jacques Whitford recorded any identifying information (if present and readily visible) on the individual transformers (i.e., manufacturer's names, model numbers, serial numbers) to determine if there is an historical record for these units of containing PCBs. The site assessment determined if there were readily visible existing, useable ports available on the transformers for the collection of oil samples (no intrusive inspections were completed); and,
5. Visual inspections were limited to safely and readily accessible portions of the site, site buildings, facilities and equipment.

2.2.4 Mold Assessment

The following describes the scope of work and methodology for the mold assessment:

1. Carried out a visual inspection in the buildings for evidence of suspect mold and/or water-damaged building materials;



2. The interior inspections were generally carried out on a non-intrusive basis;
3. Visual inspections and sampling was limited to safely and readily accessible portions of the site buildings, facilities and equipment;
4. Presented a list of all buildings with visual evidence of suspect mold and with visual evidence of water-damaged building materials;
5. The scope of work of the mold assessment did not include the collection of bulk samples from the building interiors for mold analysis; and,
6. The scope of work did not include air quality testing for mold or development of specifications or tender documents for the remediation of any identified suspect mold or water-damaged building materials.

2.2.5 Other Identified Hazardous Materials

The following describes the scope of work and methodology to identify other hazardous materials:

1. Carried out a visual inspection in each room of each building for evidence of stored chemicals and/or other hazardous building materials;
2. The interior inspections were generally carried out on a non-intrusive basis;
3. Visual inspections were limited to safely and readily accessible portions of the site buildings, facilities and equipment;
4. Presented a list of all buildings with visual evidence of stored chemicals and/or other hazardous building materials; and,
5. The scope of work did not include the collection of samples for chemical analysis.

2.3 Quality Assurance/Quality Control (QA/QC) Sampling Program

A brief overview of the QA/QC program for testing at the Consolidated Rambler Copper Mine property is presented below:

- All sampling apparatus was decontaminated prior to and between sampling events. In addition, gloves were worn by the samplers and all other handlers of the samples.
- Duplicate samples were collected to check for the natural sample variance and the consistency of field techniques and laboratory analysis. The initial sample bottles for a particular parameter or set of parameters were filled first and then the duplicate sample bottles were filled. The duplicate samples were handled in the same manner as the initial sample. A total number of duplicate samples, equal to 10% of the total number of samples, were assigned a QA/QC identification number, stored in an iced cooler, and shipped to the laboratory with the other samples. The blind duplicate samples collected are as follows:
 - Duplicate #2 (RM-JW07-MW1-SS4) for TPH/BTEX
 - Duplicate #3 (RM-JW07-MW6-SS3) for cyanide

- Duplicate #4 (RM-JW07-MW8-SS1) for TPH/BTEX
- Replicate sampling is a standard QA/QC procedure carried out by Maxxam Analytics Inc. and comprises 10% of the total number of samples being analysed.
- All samples were sent to the laboratory quickly enough so that sample-holding times were not exceeded. Samples were stored and sent in coolers packed with ice or ice packs with sufficient packing material so that samples would not be broken.
- Duplicate samples of materials collected for the hazardous materials assessment were also submitted as blind duplicates to check for the natural sample variance and the consistency of field techniques and laboratory analysis. The duplicate samples were handled in the same manner as the initial sample. A total number of duplicate samples, equal to 10% of the total number of samples, were assigned a QA/QC identification number, and shipped to the laboratory with the other samples. The blind duplicate samples collected are as follows:
 - Duplicate #1 (JW07-BHA-ASB8 – a duplicate of JW07-BHA-ASB3) for asbestos in drywall joint compound
 - Duplicate #2 (JW07-RMM-PS11 – a duplicate of JW07-RMM-PS8) for lead and mercury in paint
 - Duplicate #3 (JW07-EM-PS7 – a duplicate of JW07-EM-PS2) for lead, lead leachability and mercury in paint
- Chain of Custody forms were filled out for all lab shipments with Jacques Whitford personnel keeping a legible copy.

There are no firm guidelines for the degree of correlation expected between field duplicates due to natural heterogeneity in soil type (e.g., grain size, clay fraction) and building materials and contaminant distribution. However, the laboratory data is considered to indicate an acceptable duplicate correlation. The blind duplicate sample results for the six (6) duplicate samples agree reasonably close with the corresponding samples and confirms the representativeness of the sampling procedures.

3.0 RESULTS

3.1 Raymo Processing Facility Area - Phase III ESA

3.1.1 Site Description

The Raymo Processing Facility is located directly southeast and adjacent to the Tailings Area. 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 (as shown on Drawing No. 1028976-EE-03 in Appendix 2a). 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, approximately 1 km southwest of the facility (as shown on Drawing No. 1028976-EE-03 in Appendix 2a). Based on information provided in the Phase II ESA, approximately 350 steel drums containing varying amounts of cyanide residue were previously stored in the cyanide drum storage area. It is reported that all drums were rinsed in the holding pond (i.e., vats) at the Raymo Processing Facility, crushed and transported to the Baie Verte Public Landfill for disposal in December 1999. During the current investigation a full, steel drum of cyanide salt was unearthed in the cyanide drum storage area during test pitting. Please note that since field personnel were not trained or equipped to handle, remove or dispose of the drum of cyanide at the time of the field investigation, the drum of cyanide was reburied at its original site. The DNR-MDD were first advised of the discovery of the drum of cyanide in the draft version of this report, submitted on December 13, 2007.

Terrain in the processing facility area is generally flat with a moderate sloping embankment along the north boundary adjacent to the Tailings Area and a gently to moderately sloping embankment along the south boundary to adjacent low-lying undeveloped bog and wooded areas. Terrain in the cyanide drum storage area also slopes moderately southwards towards an adjacent low-lying undeveloped bog and wooded area. Surface drainage (apparent groundwater flow direction) appears to follow the general slope, flowing northwest towards the Tailings Area in the northern portion of the site, and flowing south towards the adjacent undeveloped bog and wooded areas in the southern portion of the processing facility site, as well as in the cyanide drum storage area.

A surface water drainage ditch is present along the northern boundary of the processing facility area adjacent to the Tailings area, and flows towards a small unnamed stream located approximately 200 m northwest of the site. The Phase I ESA indicated the presence of a flooded sump along the north edge of the processing facility, directly adjacent and up-gradient of the nearby surface water drainage ditch.

3.1.2 Previous Work

The Phase II ESA previously completed in the Raymo Processing Facility area included the excavation of nine (9) test pits, the installation of one (1) monitor well, the collection of soil samples for chemical analysis of petroleum hydrocarbons, metals, cyanide, PCBs and pH, and the collection of a groundwater sample for chemical analysis of petroleum hydrocarbons, metals, general chemistry and cyanide, the collection of a sediment sample from the holding pond (i.e., vats) of the processing facility for metals, cyanide and pH analyses, and the collection of one surface water sample from the drainage ditch located north of the processing facility and one surface water sample from the holding pond (i.e., vats) of the processing facility for general water chemistry, metals and cyanide analyses. The sampling locations for soils, groundwater, freshwater sediments and surface water collected as part of the previous Phase II ESA are shown on Drawing No. 1028976-EE-03 in Appendix 2a, and summary tables of results of laboratory analysis are provided in Appendix 2c. The results of the Phase II ESA in the Raymo Processing Facility area can be summarized as follows:

- 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 2006 Atlantic PIRI Tier I RBSL of 20,000 µg/L.

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

- Concentrations of petroleum hydrocarbons, PCBs and PAHs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.
- Concentrations of petroleum hydrocarbons (with the exception of toluene) and cyanide in all groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.

3.1.3 Field Work

Fieldwork completed as part of the current investigation in the Raymo Processing Facility area comprised excavation of ten (10) test pits and installation of three (3) monitor wells. A sample location map (Drawing No. 1028976-EE-03) showing the location of these, as well as general site features and former Phase II ESA sample locations is provided in Appendix 2a.

3.1.4 Stratigraphy

The stratigraphic information recorded during the current investigation is presented on the Test Pit and Monitor Well Records in Appendix 2b. Fill materials were encountered at or near the surface at all test pit and monitor well locations and ranged in thickness from 0.3 m in test pit RP-TP4 (located in the former cyanide storage area) to greater than 4.57 m in monitor well RP-MW3 (located in the processing facility site area). Fill material generally comprised loose to dense brown to grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders.

Bedrock was encountered at the base of all ten (10) test pits investigated at the site, as well as beneath the fill material in monitor well RP-MW1 (located in the former cyanide storage area), and comprised variably fractured grey to dark green mafic and felsic volcanic rocks.

3.1.5 Groundwater Conditions

The depth to the groundwater table as measured on September 20, 2007 ranged from 1.8 m in monitor well RP-MW3 (located in the processing facility area) to 2.99 m in RP-MW1 (located in the former cyanide storage area). Measured groundwater elevations in the processing facility area ranged from 97.45 m in RP-MW2 to 98.2 m in RP-MW3. Groundwater levels in these monitor wells are expected to vary seasonally and in response to individual precipitation events.

No groundwater seepage was encountered in any of the test pits completed at the site at the time of excavation and backfilling. Test pits are not normally left open long enough for groundwater levels to stabilise in the excavations, therefore groundwater level estimates at these locations have to be considered with caution.

Groundwater elevation data indicates shallow groundwater flow northwest towards the Tailings Area in the northern portion of the site in the vicinity of monitor wells RP-MW2, RP-MW3 and former monitor well RFP-MW1. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow in the southern portion of the processing facility site.

However, based on local topography and site observations, the direction of groundwater flow in the the southern portion of the processing facility site is inferred to be southwards towards the adjacent low-lying, bog and wooded area. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow in the former cyanide storage area. However, based on local topography and site observations, the direction of groundwater flow in the former cyanide storage area site area is inferred to be southwards towards the adjacent low-lying, bog and wooded area. The inferred direction of shallow groundwater flow in the northern and southern portions of the processing facility area and former cyanide storage area is shown on Drawing No. 1028976-EE-03 in Appendix 2a.

3.1.6 Free Liquid Phase Petroleum Hydrocarbons

Free liquid phase petroleum hydrocarbons were not observed at this site during the current investigation or the previous Phase II ESA.

3.1.7 Soil Vapor Concentrations

The soil vapour concentrations measured in each of the soil samples from the test pits are provided on the Test Pit Records in Appendix 2b. The vapour concentrations measured ranged from non-detect to 9.5 ppm. The soil vapour concentrations measured in each of the soil samples from the monitor wells are provided on the Monitor Well Records in Appendix 2b. The vapour concentrations measured ranged from 2.4 to 7.2 ppm.

Soil vapour concentrations vary with both fuel type and age, and it should be noted that the readings are intended to provide only a qualitative indication of volatile hydrocarbon levels and are not directly equivalent to soil analytical results. Soil vapor concentrations which exceed 50 ppm may indicate the presence of petroleum hydrocarbon impacts in soil. No soil vapour concentrations above 50 ppm were measured in any of the soil samples collected from test pits and monitor wells at the site.

3.1.8 Soil & Groundwater Chemical Analysis & Results

A laboratory analysis schedule for the Raymo Processing Area is presented in Table 2.

Table 2 Laboratory Analysis Schedule (Raymo Processing Facility Area)

Potential Environment Concern	Sample Location	Sample Matrix	
		Soil	Groundwater
Potential for petroleum hydrocarbon impacts related to former equipment storage	Former cyanide storage area - RP-TP8	1	None
Potential for VOCs (toluene) impacts related to historical storage and usage	Former processing facility – RP-MW2, RP-MW3, RPF-MW1	2	3
Potential for PCBs impacts related to former equipment storage	Former cyanide storage area – RP-TP6, RP-TP7, RP-TP8	3	None
Potential for cyanide impacts related to historical storage and use	Former processing facility – RP-TP1 to RP-TP3, RP-TP9, RP-TP10 Former cyanide storage area – RP-TP4 to RP-TP7, RP-MW1	10	1

Note: The methodologies utilised by Maxxam Analytics Inc. in analysis of the soil and groundwater samples are presented on the analytical reports in Appendix 2d.



Results of the laboratory analysis of soil and groundwater samples obtained from this site are presented in Tables 2.1 to 2.6 in Appendix 2c, along with applicable summary tables of results of chemical analysis for soil and groundwater carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for the current investigation are presented in Appendix 2d.

3.1.8.1 Petroleum Hydrocarbons in Soil

Petroleum hydrocarbon analysis was conducted on one soil sample collected from test pit RP-JW07-TP8 in the former cyanide storage area. Results of laboratory analysis of this soil sample for petroleum hydrocarbon indicator compounds (TPH and BTEX) are presented in Table 2.1 in Appendix 2c, along with summary tables of results of petroleum hydrocarbon analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for the current investigation are presented in Appendix 2d.

No concentrations of TPH and BTEX were detected in the soil sample analyzed at the site.

3.1.8.2 Volatile Organic Compounds in Soil

VOCs analysis was conducted on two soil samples, including one each collected from monitor wells RP-JW07-MW2 and RP-JW07-MW3 in the processing facility area. The results of the laboratory analysis for soil samples collected at the site for VOCs are presented in Table 2.2 in Appendix 2c. The corresponding analytical report from Maxxam Analytics Inc. is presented in Appendix 2d.

No concentrations of VOCs were detected in any of the soil samples analyzed.

3.1.8.3 Polychlorinated Biphenyls in Soil

PCBs analysis was conducted on three soil samples including one each collected from test pits RP-JW07-TP6 to RP-JW07-TP8 in the Cyanide Storage area. Results of the laboratory analysis of these soil samples for PCBs are presented in Table 2.3 in Appendix 2c, along with summary tables of results of petroleum hydrocarbon analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. for PCBs analysis in soil carried out during the current investigation is presented in Appendix 2d.

PCBs were detected in soil sample RP-JW07-TP8-BS3 at a concentration of 0.14 mg/kg, which is below the applicable CCME criteria for PCBs in soil at an industrial site of 33 mg/kg. No concentrations of PCBs were detected in any of the other soil samples analyzed at the site.

3.1.8.4 Cyanide in Soil

Total cyanide analysis was conducted on ten soil samples including, five soil samples from test pits in the processing facility area (i.e., RP-JW07-TP1 to RP-JW07-TP3, RP-JW07-TP9 and RP-JW07-TP10) and five soil samples from test pits (i.e., RP-JW07-TP4 to RP-JW07-TP7) and the monitor well (RP-JW07-MW1) in the former cyanide drum storage area. Results of the laboratory analysis of these soil samples for total cyanide are presented in Table 2.4 in Appendix D, along with summary tables of results of total cyanide analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. for total cyanide analysis in soil carried out during the current investigation is presented in Appendix 2d.

Total cyanide was detected in six soil samples analyzed, returning values ranging from 0.8 mg/kg in soil sample RP-JW07-TP5-BS1 in the former cyanide drum storage area to 22 mg/kg in soil sample RP-JW07-MW1-SS1 in the former cyanide storage area. No concentrations of total cyanide were detected in soil samples RP-JW07-TP4-BS1, JW07-TP6-BS1 and JW07-TP7-BS1 in the former cyanide drum storage area, and soil sample RP-JW07-TP9-BS4 in the former processing facility area. The concentration of total cyanide detected in soil sample RP-JW07-MW1-SS1 in the former cyanide drum storage area exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg. None of the other detected levels of total cyanide in the soil samples analyzed at the site exceeded the CCME guideline for free cyanide in soil on an industrial site.

3.1.8.5 Volatile Organic Compounds in Groundwater

VOCs analysis was conducted on three groundwater samples, including one each from monitor wells RP-JW07-MW2 and RP-JW07-MW3 in the former processing facility area, as well as one groundwater sample from former monitor well (RPF-MW1). Results of laboratory analysis of these groundwater samples for VOCs are presented in Table 2.5 in Appendix 2c, along with results of petroleum hydrocarbons analysis for groundwater carried out as part of the previous Phase II ESA (i.e., for comparison of results of toluene in groundwater in former monitor well RPF-MW1). The corresponding analytical report from Maxxam Analytics Inc. for VOCs analysis in groundwater carried out during the current investigation is presented in Appendix 2d.

Concentrations of various VOCs, including benzene, ethylbenzene, toluene and xylenes were detected in the groundwater samples collected from RP-JW07-MW2 and RP-JW07-MW3, however none of the detected concentrations of VOCs exceeded the applicable MOE groundwater standards for these parameters. No concentrations of VOCs were detected in the groundwater sample collected from monitor well RPF-MW1.

3.1.8.6 Cyanide in Groundwater

Total cyanide analysis was conducted on a groundwater sample collected from monitor well, RP-JW07-MW1, in the former cyanide drum storage area. Results of laboratory analysis of this groundwater sample for total cyanide is presented in Table 2.6 in Appendix 2c. The corresponding analytical report from Maxxam Analytics Inc. for total cyanide analysis in groundwater carried out during the current investigation is presented in Appendix 2d.

No concentration of total cyanide was detected in the groundwater sample analyzed at the site.

3.1.9 Discussion & Conclusions of Phase III ESA

A Phase III ESA was completed in the Raymo Processing Facility area at the Former Consolidated Rambler Mine property by Jacques Whitford on behalf of the Newfoundland and Labrador Department of Natural Resources - Mineral Development Division to further delineate environmental impacts identified in the previous Phase II ESA. The conclusions of this assessment are summarised below.

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised comprised loose to dense brown to grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders overlying variably fractured grey to dark green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.3 m in test pit RP-TP4 (located in the former cyanide storage area) to greater than 4.57 m in monitor well RP-MW3 (located in the processing facility site area).



2. Groundwater was encountered at depths ranging from 1.8 m to 2.99 m below the ground surface in the monitor wells completed at this site. No groundwater seepage was encountered in any of the test pits completed at the site. Groundwater elevation data indicates shallow groundwater flow northwestward towards the Tailings Area in the northern portion of the processing facility area. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow in the southern portion of the processing facility area and the former cyanide drum storage area. However, based on local topography and site observations the direction of groundwater flow is inferred to be southwards towards the low-lying, bog and wooded areas in these areas of the site.
3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA.
4. The concentration of total cyanide detected in soil at monitor well RP-MW1, located in the former cyanide drum storage area, exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg. Concentrations of total cyanide detected during the previous Phase II ESA 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 CCME criteria for free cyanide in soil at an industrial site of 8 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.
5. The estimated extent of total cyanide in soil exceeding the applicable CCME criteria for an industrial site in the vicinity of monitor well RP-MW1 and former test pit RPF-TP7, located in the former cyanide drum storage area, is shown on Drawing No. 1028976-EE-04 in Appendix 2a. The estimated area with total cyanide concentrations in soil above 8 mg/kg in this area is approximately 150 m². Based on analytical evidence of impacts and the noted depth to bedrock (0.8 m) in this area, it is expected that approximately 120 m³ of impacted soil in the vicinity of monitor well RP-MW1 and former test pit RPF-TP7, exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
6. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of former test pit RPF-TP3, located in the former processing facility area, is shown on Drawing No. 1028976-EE-04 in Appendix 2a. The estimated area with total cyanide concentrations in soil above 8 mg/kg in this area is approximately 25 m². Vertical delineation of total cyanide impacts in soil have not been carried out in this area, and it is assumed that total cyanide impacts are present in the upper 1 m of soil in this area, and that approximately 25 m³ of impacted soil is present in the vicinity of former test pit RPF-TP3 that exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
7. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of former test pit RPF-TP4, located in the former processing facility area, is shown on Drawing No. 1028976-EE-04 in Appendix 2a. The estimated area with total cyanide concentrations in soil above 8 mg/kg in this area is approximately 50 m². Based on analytical evidence of impacts and the noted depth to bedrock (0.6 m) in this area, it is

expected that approximately 30 m³ of impacted soil in the vicinity of former test pit RPF-TP4, exceeds the CCME criteria for free cyanide in soil on an industrial site. Most of the impacted soils in this area are readily accessible for removal, if required. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.

8. Based on NLDEC policy directive PPD05-01, remediation of cyanide impacted soil at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach, remediation of cyanide impacted site soil and groundwater would be governed by site-specific threshold limit criteria determined for this contaminant.
9. No concentrations of VOCs, including toluene, were detected in the groundwater samples collected from RP-JW07-MW2 and RP-JW07-MW3 that exceeded the applicable MOE groundwater standards for these parameters. No concentrations of VOCs were detected in the groundwater sample collected from monitor well RPF-MW1.

3.2 Raymo Processing Facility Area - Hazardous Materials Assessment

The following buildings in the Raymo Processing Facility Area were assessed as part of the Hazardous Materials Assessment:

- Rock Crushing Equipment
- Storage Tower
- Partially enclosed structure housing electrical utilities

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment.

3.2.1 Asbestos-Containing Materials (ACMs)

3.2.1.1 Previous Work

No previous work for asbestos was completed in the Raymo Processing Facility Area.

3.2.1.2 Phase III ESA Asbestos Survey Scope and Methodology

The Asbestos Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. No potential ACMs were observed in the subject buildings.

3.2.2 Lead, Mercury & PCBs Based Paints

3.2.2.1 Previous Work

The paint survey previously completed in the Raymo Processing Facility Area included the collection of the following:

- 2 – paint chip samples (RPF-PS1 and RPF-PS2) from processing equipment for lead, lead leachate, mercury and PCB analyses.



The analytical results from the Phase II ESA are presented in Appendix 2c. 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 analysis. 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 was 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.

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. 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 was not at a level considered hazardous, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

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 analysis. The results were compared to the Federal HPA criterion of 10 mg/kg and the CCME guideline of 50 mg/kg for mercury in soil at an industrial 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 (RPF-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 guideline for mercury in soil at an industrial site (50 mg/kg), these paints, if removed from the Site, may be disposed of at an approved landfill facility.

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 analytical result was compared to the CCME guideline of 33 mg/kg for PCB in soil at a commercial/industrial site. Results of the paint sampling program revealed that the concentration of PCB (16.6 mg/kg) detected in the paint sample RPF-PS1 (16.6 mg/kg) did not exceed the applicable assessment criterion of 33 mg/kg. Since the level of PCB detected in the paint sample RPF-PS1 did not exceed the CCME guideline for PCB in soil at an industrial site (33 mg/kg), this paint, if removed from the Site, may be disposed of at an approved landfill facility.

3.2.2.2 Phase III ESA Paint Survey Scope and Methodology

The Paint Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Jacques Whitford attempted to correlate in the field the locations of the previous paint samples collected and analyzed during the Phase II ESA. No other potential paint locations or colours were observed that warranted sampling.

3.2.2.3 Discussion and Recommendations

Based on the results of the sampling and analysis, elevated lead concentrations (i.e., greater than 600 mg/kg) are present in the blue on green on red paint from the Drum/Equipment and the blue on red paint from the Tower.



Based on the results of the sampling and analysis, elevated mercury concentrations (i.e., greater than 10 mg/kg) are not present in these two paint samples.

Results revealed that the concentrations of lead leachate detected in the paint samples analyzed did not exceed the applicable assessment criterion of 5.0 mg/L. Therefore, these paints, if removed from the Site, may be disposed of at an approved landfill facility.

The paints in the Former Raymo Processing Area were in generally fair to good condition. Lead containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting. Lead based paints that are in poor condition may pose health concerns for building occupants. Lead based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.

3.2.3 Polychlorinated Biphenyls (PCBs)

No electrical transformers, which could contain PCBs, were observed in the buildings and no fluorescent light fixtures were observed.

3.2.4 Other Identified Hazardous Materials

No other identified hazardous materials were observed within the buildings.

3.2.5 Mold

No extensive water damaged building materials or suspect mold growth was observed within the buildings.

3.3 East Mine Area – Phase III ESA

3.3.1 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 (as shown on Drawing No. 1028976-EE-06 in Appendix 3a). 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 PCBs storage, however documentation suggests that all PCBs 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).

The concrete slab foundation of former Building No. 3 remains on the site.

3.3.2 Fieldwork

Based on testing completed as part of the Phase II ESA, no petroleum hydrocarbon, PCBs or PAHs impacts were identified in the East Mine Area. Therefore, no Phase III ESA activities were recommended for the East Mine Area in the Phase II ESA report, and no additional environmental site assessment work was carried out in this area as part of the current investigation

3.4 East Mine Area - Hazardous Materials Assessment

The following buildings in the East Mine Area were assessed as part of the Hazardous Materials Assessment:

- Building No. 1
- Building No. 2

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interior of Building No. 1 was not accessed and the interior of Building No. 2 was not assessed entirely due to the poor structural condition of the buildings.

3.4.1.1 Previous Work

The Hazardous Materials Assessment previously completed in the East Mine Area included the collection of the following:

- 1 – pipe insulation sample (EM-ASB1), 1 – drywall compound sample (EM-ASB2) and 1 – exterior siding sample (EM-ASB3) from Building No. 2 for asbestos analysis.

The analytical results from the Phase II ESA are presented in Appendix 3b. A total of three building material samples (EM-ASB1 to EM-ASB3) collected from Building No. 2 present at the Site were analyzed for asbestos. Analytical results revealed that concentrations of asbestos detected in samples EM-ASB2 (10% chrysotile) and EM-ASB3 (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-ASB1 which was 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.

3.4.1.2 Phase III ESA Asbestos Survey Scope and Methodology

The Asbestos Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Jacques Whitford attempted to correlate in the field the locations of the previous asbestos samples collected and analyzed during the Phase II ESA. Jacques Whitford collected samples of two potential ACMs observed in Building No. 2 that were similar to those collected in the Phase II ESA. During the sampling, a visual determination of the condition of the material, the accessibility, contact potential, exposure, and friability was made in the building. The materials were observed to be in poor to good condition at the time of the assessment.

Upon entry into each room, a visual identification of both friable (i.e., can easily be crumbled or pulverized by manual pressure) and non-friable potential ACMs was performed. The specifics of the potential ACMs including their condition, location and degree of friability were documented.



The following definitions were used in assessing the degree of friability and condition of ACMs:

Friability:

- HIGH** Readily releases airborne fibres where brushed against or otherwise disturbed (i.e., sprayed fireproofing, stipple)
- MEDIUM** Stable if left untouched or protective coating is undisturbed. However, easily releases airborne fibres once the protective coating is punctured or otherwise damaged (i.e., aircell pipe insulation, magblock boiler insulation)
- LOW** Stable if left untouched or protective coating is undisturbed. Requires some degree of effort to release airborne fibres once the protective coating is damaged or otherwise disturbed (i.e., parging on pipe elbows, fittings and valves, gaskets, suspended ceiling tiles)
- NONE** Asbestos fibres contained in a stable matrix, unlikely to release airborne asbestos if damaged or otherwise disturbed (i.e., floor tile, drywall joint filler compound, plaster, hardboard, exterior shingles)

Condition:

- GOOD** No exposed friable ACMs, protective coating not damaged
- FAIR** Minor damages to protective coating or exposure of ACMs
- POOR** Damaged or fallen asbestos material, hazard of worker exposure to asbestos

The survey and sampling of ACMs was generally limited to readily visible or easily accessible materials inside or on the subject buildings. At the time of the site visit, the interior areas of the buildings were not completely accessible to Jacques Whitford for inspection due to the poor structural condition of the buildings. There was limited intrusive sampling conducted within wall cavities as ACMs were not expected to be within the wall cavities. The asbestos assessment did not include any intrusive sampling of the roofing materials on the buildings.

3.4.1.3 Results

During the site inspection, two (2) bulk samples of possible ACM were collected from Building No. 2 (JW07-EM-ASB1 which was a sample from exterior siding and JW07-EM-ASB2 which was a sample of drywall joint compound). The bulk samples were sent to Maxxam Analytics Inc. for confirmatory asbestos analysis. Asbestos was not confirmed to be present in the sample JW07-EM-ASB2. Sample JW07-EM-ASB1 (exterior siding from Building No. 1) was found to contain 20-40% chrysotile asbestos. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted, the sample analyses and the locations of visually similar materials is included in Table 3.1 in Appendix 3b. The locations where the bulk samples were collected are noted on Drawing No. 1028976-EE-08 in Appendix 3a.

3.4.1.4 Discussion and Recommendations

Friable ACMs

Based on the results of the Phase II and Phase III ESAs, friable asbestos was not confirmed to be present in the buildings.

Non-Friable ACMs

Based on the results of the Phase II ESA and Phase III ESAs, non-friable asbestos was confirmed to be present in the buildings and included drywall joint compound (approximately 12 m² in poor condition) and exterior siding on Building No. 2 (approximately 200 m² in good condition).

Other Possible ACMs

No other ACMs are expected to be present in concealed wall or ceiling spaces of the buildings.

The management of asbestos-containing materials and the handling, removal and disposal of asbestos-containing materials in the buildings are to be carried out in accordance with the Newfoundland Asbestos Abatement Regulations 1998. An asbestos management action plan should be developed for the site buildings in the East Mine Area.

3.4.2 Lead, Mercury & PCBs Based Paints

3.4.2.1 Previous Work

The paint survey previously completed in the East Mine Area included the collection of the following:

- 7 – paint chip samples (EM-PS1 to EM-PS7) from processing equipment for lead, lead leachate, mercury, PCB and PCB leachate analyses.

The analytical results from the Phase II ESA are presented in Appendix 3b. 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 analysis. 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, are 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. Since concentrations of lead in paint samples EM-PS3 (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

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 metal substrate), this paint, if removed from the Site, must be disposed of as hazardous waste. In most

cases, when the mass of equipment is considered, the overall calculated lead concentration drops below 600 mg/kg if the paint is intact on the equipment.

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 analysis. The results are compared to the Federal HPA criterion of 10 mg/kg and the CCME guideline of 50 mg/kg for mercury in soil at an industrial 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 applicable CCME guideline for mercury in soil, leachability testing for mercury was not carried out on the paint samples.

One paint sample (EM-PS1) collected from the interior wall of Building No. 2 (light green paint) was submitted to the laboratory for PCB analysis. The results are compared to the CCME guideline of 33 mg/kg for PCB in soil at a commercial/industrial 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 guideline of 33 mg/kg. Results of leachability testing 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.

3.4.2.2 Phase III ESA Paint Survey Scope and Methodology

The Paint Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Jacques Whitford attempted to correlate in the field the locations of the previous paint samples collected and analyzed during the Phase II ESA. During the site inspection, six (6) paint samples were collected from Building No. 2. The bulk samples were sent to Maxxam Analytics Inc. for lead and mercury analyses. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted and the sample analyses is included in Table 3.2 in Appendix 3b. The locations where the bulk samples were collected are noted on the drawing in Appendix 3a.

3.4.2.3 Results

The samples collected included grey paint on interior drywall (JW07-EM-PS1), green paint from a compressor (JW07-EM-PS2), grey paint from hoist equipment (JW07-EM-PS3), grey on green on yellow on red paint from hoist equipment (JW07-EM-PS4), red on grey paint from concrete blocks (JW07-EM-PS5) and interior turquoise paint on plywood, steel and drywall walls (JW07-EM-PS6).

The concentrations of lead detected in four of the paint samples were above the Federal HPA criterion of 600 mg/kg and are, therefore, considered to be a health hazard during any renovation/demolition activities at the Site. These samples include the green paint from a compressor (JW07-EM-PS2), grey paint from hoist equipment (JW07-EM-PS3), grey on green on yellow on red paint from hoist equipment (JW07-EM-PS4) and red on grey paint from concrete blocks (JW07-EM-PS5). These bulk samples of paint were analyzed for lead leachability. The concentrations of lead leachate in the samples from the green paint from a compressor and the grey on green on yellow on red paint from hoist equipment were in excess of 5 mg/L and, therefore, are considered to be leachable and are hazardous materials for disposal purposes. In most cases, when the mass of equipment is considered, the overall calculated lead concentration drops below 600 mg/kg if the paint is intact on the equipment.



The concentrations of mercury detected in the paint samples were all below the Federal HPA criterion of 10.0 mg/kg and are therefore not considered to be a health hazard during any renovation/demolition activities at the Site.

3.4.2.4 Discussion and Recommendations

Based on the results of the sampling and analysis, elevated lead concentrations (i.e., greater than 600 mg/kg) are present in the grey paint from a possible boiler in Building No. 1; light green wall paint, grey wall paint, green on grey paint from a compressor, red on green on grey paint from hoist equipment, red paint from steel beams, grey on green paint from equipment, green paint from a compressor, grey paint from hoist equipment, grey on green on yellow on red paint from hoist equipment and red on grey paint from concrete blocks in Building No. 2. Results revealed that the concentration of lead leachate in paint sample EM-PS7 (5.29 mg/L), JW07-EM-PS2 (15 mg/L) and JW07-EM-PS4 (8.4 mg/L) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentrations of lead leachate in these paints are at levels considered hazardous, in the absence of further rationalization (i.e., dilute with metal substrate), these paints, if removed from the Site, must be disposed of as hazardous waste. In most cases where applicable, when the mass of equipment is considered, the overall calculated lead concentration drops below 600 mg/kg if the paint is intact on the equipment.

Based on the results of the sampling and analysis, elevated mercury concentrations (i.e., greater than 10 mg/kg) are not present in paint samples submitted from the East Mine site. Therefore, these paints (except for paint samples EM-PS7, JW07-EM-PS2 and JW07-EM-PS4), if removed from the Site, may be disposed of at an approved landfill facility.

Based on the results of the sampling and analysis, elevated PCB concentrations (i.e., greater than 33 mg/kg) are present in the light green paint from the interior wall of Building No. 2. Results revealed that the concentration of PCB leachate detected in the paint sample analyzed 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.

The paints in the East Mine Area were in generally poor condition. Lead, Mercury and PCB containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting. Lead, Mercury and PCB based paints that are in poor condition may pose health concerns for building occupants. Lead and Mercury and PCB based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.

3.4.3 Polychlorinated Biphenyls (PCBs)

3.4.3.1 Previous Work

During the Phase II ESA, 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 from the Phase II ESA are presented in Appendix 3b. The results are compared to the CCME guideline 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.

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 results from the Phase II ESA are presented in Appendix 3b. 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 cm² 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 ug/100 cm²) exceeded the U.S. EPA guideline of 10 ug/100 cm². 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.

3.4.3.2 Phase III ESA

No electrical transformers, which could contain PCBs, were observed in the buildings and no fluorescent light fixtures were observed.

3.4.4 Other Identified Hazardous Materials

No other identified hazardous materials were observed within the buildings.

3.4.5 Mold

No extensive water damaged building materials or suspect mold growth was observed within the buildings.

3.5 Tailings Pile – Phase III ESA

3.5.1 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 (as shown on Drawing No. 1028976-EE-07 in Appendix 4a). 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.

3.5.2 Fieldwork

No Phase III ESA activities were recommended for the Tailings area in the Phase II ESA report, and no further work was carried out during the Phase III ESA.

3.6 Tailings Pile - Hazardous Materials Assessment

The following building in the Tailings Area was assessed as part of the Hazardous Materials Assessment:

- Monitoring Station

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site building, facilities and equipment.

3.6.1.1 Previous Work

No previous work for asbestos was completed in the Tailings Area.

3.6.1.2 Phase III ESA Asbestos Survey Scope and Methodology

The Asbestos Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Jacques Whitford attempted to correlate in the field the locations of the previous asbestos samples collected and analyzed during the Phase II ESA. No potential ACMs were observed in the subject building.

3.6.2 Lead, Mercury & PCBs Based Paints

3.6.2.1 Previous Work

The paint survey previously completed in the Tailings Area included the collection of the following:

- 1 – paint chip sample (TAIL-PS1) from the green painted surfaces of the Monitoring Station for lead and mercury analysis.

The analytical results from the Phase II ESA are presented in Appendix 4b and the drawing showing the sample location is found in Appendix 4a. 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 analysis. 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.

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 analysis. The result was compared to the Federal HPA criterion of 10 mg/kg and the CCME guideline of 50 mg/kg for mercury in soil at an industrial 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 applicable CCME guideline, this paint, if removed from the Site may be disposed of at an approved landfill facility.

3.6.2.2 Phase III ESA Paint Survey Scope and Methodology

The Paint Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Jacques Whitford attempted to correlate in the field the location of the previous paint sample collected and analyzed during the Phase II ESA. No other potential paint locations or colours were observed that warranted sampling.



3.6.2.3 Discussion and Recommendations

Based on the results of the sampling and analysis, elevated lead concentrations (i.e., greater than 600 mg/kg) and elevated mercury concentrations (i.e., greater than 10 mg/kg) were not present in the green painted surfaces of the Monitoring Station. This paint, if removed from the Site, may be disposed of at an approved landfill facility.

3.6.3 Polychlorinated Biphenyls (PCBs)

No electrical transformers, which could contain PCBs, were observed in the building and no fluorescent light fixtures were observed.

3.6.4 Other Identified Hazardous Materials

No other identified hazardous materials were observed within the building.

3.6.5 Mold

No extensive water damaged building materials or suspect mold growth was observed within the building.

3.7 Rambler Main Mine Area – Phase III ESA

3.7.1 Site Description

The Rambler Main Mine area is located approximately 500 m east of the Raymo Processing Facility and consists of 14 main structures, including the main mill building, crusher building, chemistry laboratory, maintenance garage, storage shack, hoist building, core shack, refueling station, security shed, weigh scales, main office building, pumphouse, storage shed and a storage rack (as shown on Drawing No. 1028976-EE-08 in Appendix 5a). In addition, a Butler Building was formerly located south of the crusher building that housed an electrical/mechanical workshop, a change room, warehouse and two offices (engineering office and general office).

Based on observations during the previous Phase I and II ESA, as well as observations during the current investigation, other site features and infrastructure present in the Rambler Main Mine area include a pad-mounted transformer located approximately 30 m east of the security shed, a pole-mounted transformer between the security shed and the pad-mounted transformer, two areas containing several empty 45-gallon drums, currently filled with gravel and sand, west and southwest of the main mine building, a potential PCBs and reagent storage area located on the east side of the main mill building storage area, a storage shack containing five 45-gallon drums (full) of an unknown substance on the southeast corner of the main mill building, an empty 45-gallon drum, labeled cyanide, present near a partially opened door on the west side of the main mill building, three empty deteriorated 45-gallon drums on the southwest corner of the chemical laboratory, as well as a large quantity of product samples and laboratory chemicals and reagents present within the building, and several disposal areas of various metal and wooden debris, including south of the security shed, maintenance garage and storage shed, and scattered throughout a drainage ditch running along the eastern boundary of the site. Various above and underground fuel storage tanks are present at the site.

including two 200-gallon ASTs and a diesel-powered generator on the east side of the mill building, a possible underground storage tank (UST) on the north side of the maintenance garage, and two USTs (one gasoline and one diesel) approximately 2 to 3 m north of the refueling station. In addition, a concrete AST cradle is present on the north side of the hoist building, and two discarded USTs are present on the south and east of the maintenance garage. During the current investigation, a number of transformers were stored in the hoist building, several of which appeared to have been drained of their dielectric fluids and the interior core removed. In addition observations during the current investigation indicated that a valve on the pad-mounted transformer, located along the gravel access road approximately 150 m west of the Rambler Main Mine area, was leaking and the capacitor in one of the transformer compartments had been drained spilling dielectric fluids to the surrounding ground surface.

Regionally, terrain in the area gently slopes towards the northwest, and surface drainage (apparent groundwater flow direction) appears to follow the general slope, flowing towards England's Steady, located approximately 30 m northwest of the site. However, groundwater elevation data collected as part of the current investigation indicates local radial groundwater flow outwards from the area of the mill building, which sits on a slight rise with respect to surrounding areas.

A north-flowing drainage ditch is present along the eastern boundary of the site, as well as along the west side of the mill building. In addition, various trenches are present where underground electrical conduits have been removed in the area between the mill building and the crusher building.

3.7.2 Previous Work

The Phase II ESA previously completed in the Rambler Main Mine area included the excavation of 35 test pits, the installation of 6 monitor wells, the collection of soil samples for chemical analysis of petroleum hydrocarbons, metals, total cyanide, PAHs and PCBs and the collection of groundwater samples for chemical analysis of petroleum hydrocarbons, metals, general chemistry and cyanide, and the collection of freshwater sediment samples from the drainage ditch along the east boundary of the site for petroleum hydrocarbons, metals, PAHs and PCBs. The sampling locations for soils, groundwater and freshwater sediments collected as part of the previous Phase II ESA are shown on Drawing No. 1028976-EE-08 in Appendix 5a, and summary tables of results of laboratory analysis are provided in Appendix 6c. The results of the Phase II ESA in the Rambler Main Mine area can be summarized as follows:

1. The concentration of modified TPH detected in soil sample RMM-TP5-SS1 (<12,200 mg/kg), collected adjacent to and down gradient of the generator and two 910 L ASTs present on the east side of the main mill building exceeded the 2006 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.
2. A significant concentration of TPH (i.e., 1,340 mg/kg) was detected in sediment sample RMM-SED2, collected from the drainage ditch located directly east and down-gradient of the maintenance garage building.
3. Concentrations of a combination of metals detected in all soil, groundwater and sediment samples collected at the site 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.

4. The concentration of total cyanide (21.0 mg/kg) detected in one soil sample (RMM-TP3-SS2) collected at the site 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.
5. The concentration of total cyanide (0.146 mg/L) detected in one (RMM-MW1) of the six groundwater samples collected at the site 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.
6. Values of pH (2.06 to 6.01) detected in all six groundwater samples collected at the site were less than the applicable guideline CCME-FAL of 6.5 to 9.0. This indicates that groundwater throughout the site is acidic. Further, 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.
7. Concentrations of PCBs and PAHs in all soil and freshwater sediment samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.
8. Concentrations of petroleum hydrocarbons in all groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.
9. Concentrations of PCBs and PAHs in all soil and freshwater sediment samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.

3.7.3 Field Work

Fieldwork completed as part of the current investigation in the Rambler Main Mine area comprised excavation of seven (7) test pits and seven (7) monitor wells. A sample location map (Drawing No. 1028976-EE-08) showing the location of these, as well as general site features and former Phase II ESA sample locations is provided in Appendix 5a.

3.7.4 Stratigraphy

The stratigraphic information recorded during the current investigation is presented on the Test Pit and Monitor Well Records in Appendix 5b. Fill materials were encountered at or near the surface at all test pit and monitor well locations and ranged in thickness from 0.4 m in test pit RM-TP8 to greater than 4.57 m in monitor well RM-MW9. Fill material generally comprised loose to dense brown grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders.

Bedrock was encountered at the base of five (3) of the seven (7) test pits investigated at the site, as well as beneath the fill material in monitor wells RM-MW3, RM-MW4, and RM-MW7, and comprised variably fractured grey to dark green mafic and felsic volcanic rocks.

3.7.5 Groundwater Conditions

The depth to the groundwater table as measured on September 20, 2007 ranged from 0.49 m in monitor well RM-MW4 to 1.89 m in RM-MW6. Measured groundwater elevations ranged from 96.33 m

in RM-MW4 to 99.02 m in RM-MW3. Groundwater levels in these monitor wells are expected to vary seasonally and in response to individual precipitation events.

Groundwater seepage was observed on September 5, 2007 in RM-TP6 and RM-TP7 at a depth of 1.5 m. No groundwater seepage was encountered in any of the other test pits completed at the site at the time of excavation and backfilling. Test pits are not normally left open long enough for groundwater levels to stabilise in the excavations, therefore groundwater level estimates at these locations have to be considered with caution.

Groundwater elevation data indicates local radial shallow groundwater flow outwards from the mill building at the site, with groundwater flow direct determined to be toward the northeast in the vicinity of monitor wells RM-MW3, RM-MW4 and RM-MW5, towards the northwest in the vicinity of monitor well RM-MW6, and towards the southwest in the vicinity of monitor wells RM-MW7, RM-MW8 and RM-MW9. The inferred direction of regional groundwater flow in the site area, as well as locally in the vicinity of monitor wells RM-MW3, RM-MW4 and RM-MW5, RM-MW6, and RM-MW7, RM-MW8 and RM-MW9 is shown on Drawing Nos. 1028976-EE-08 to 1028976-EE-10 in Appendix 5a.

Hydraulic response (bail down) testing was conducted on September 20, 2007 on monitoring well RM-MW7 to determine the permeability of the underlying stratigraphy at the site. Data collected during the bail down test is provided in Appendix 5f. Analysis of the bail down test data for each test well was performed using the Bouwer & Rice and Hvorslev analysis methods. Analysis was conducted with the aid of the computer program AquiferTest, version 3.5 (Waterloo Hydrogeologic Inc.). The test results are graphically displayed in Appendix 5f. Analysis of test data using the Bouwer & Rice and Hvorslev methods provided similar hydraulic conductivity values for monitoring well RM-MW7 with values of $2.96E-5$ m/s determined using the Hvorslev method and $3.37E-5$ m/s determined using the Bouwer & Rice method. Based on the results of the bail down tests, an average combined hydraulic conductivity of $3.17E-5$ m/s is determined for the fill material and bedrock underlying the site.

3.7.6 Free Liquid Phase Petroleum Hydrocarbons

Free liquid phase petroleum hydrocarbons were not observed at this site during the current investigation or the previous Phase II ESA. However, during the current investigation, an oily sheen (too thin to measure) was observed on the surface of the groundwater in test pits RM-TP6 and RM-TP7, located on the west side of the mill building, and an oily residue was observed on the surface of bedrock in test pit RM-TP9, located in the fenced yard adjacent to the pad-mounted transformer, and on rock core recovered from monitor well RM-MW3, located adjacent to the generator and two 910 L ASTs present on the east side of the main mill building.

In addition, a petroleum hydrocarbon sheen was observed on groundwater within test pit ML-TP18, excavated in the vicinity of the former Bunker C AST located southwest corner of the power centre during the Phase II ESA.

3.7.7 Soil Vapor Concentrations

The soil vapour concentrations measured in each of the soil samples from the test pits are provided on the Test Pit Records in Appendix 5b. The vapour concentrations measured ranged from 1.6 to 28.7 ppm. The soil vapour concentrations measured in each of the soil samples from the monitor wells are

provided on the Monitor Well Records in Appendix 5b. The vapour concentrations measured ranged from 2.7 to 21.4 ppm.

Soil vapour concentrations vary with both fuel type and age, and it should be noted that the readings are intended to provide only a qualitative indication of volatile hydrocarbon levels and are not directly equivalent to soil analytical results. Soil vapor concentrations which exceed 50 ppm may indicate the presence of petroleum hydrocarbon impacts in soil. No soil vapour concentrations above 50 ppm were measured in any of the soil samples collected from test pits and monitor wells at the site. The oil sheen observed on groundwater in test pits RM-TP6 and RM-TP7 was associated with soil vapour concentrations less than 50 ppm.

Strong petroleum hydrocarbon odours were detected during excavation at test pit locations RM-TP6 and RM-TP7. In addition, during the current investigation, a strong petroleum hydrocarbon odor was noted emanating from the open ditch located along the west side of the mill building in the vicinity of test pits RM-TP6 and RM-TP7.

3.7.8 Soil Chemical Analysis & Results

A laboratory analysis schedule for the Rambler Main Mine Area is presented in Table 3.

Table 3 Laboratory Analysis Schedule (Rambler Main Mine Area)

Potential Environment Concern	Sample Location	Sample Matrix	
		Soil	Groundwater
Potential for petroleum hydrocarbon impacts related to historical storage and usage	RM-TP3 to RM-TP7, RM-TP9, RM-MW3, RM-MW4, RM-MW8, RM-MW9, Duplicate #4	11	5
Potential for PCBs impacts related to transformer storage and usage	RM-TP3 & RM-TP9	2	-
Potential for cyanide impacts related to historical storage and usage	RM-TP6 to RM-TP8, RM-MW5 to RM-MW7, Duplicate #3	7	3

Note: The methodologies utilised by Maxxam Analytics Inc. in analysis of the soil and groundwater samples are presented on the analytical reports in Appendix 5d.

Results of the laboratory analysis of soil and groundwater samples obtained from this site are presented in Tables 5.1 to 5.5 in Appendix 5c, along with applicable summary tables of results of chemical analysis for soil and groundwater carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for the current investigation are presented in Appendix 5d.

3.7.8.1 Petroleum Hydrocarbons in Soil

Petroleum hydrocarbon analysis was conducted on thirteen soil samples, including one each from test pits RM--TP3 to RM-TP9 and monitor wells RM-MW3, RM-MW4, RM-MW8 and RM-MW9, as well as a laboratory QA/QC duplicate sample of RM-TP7-BS4, and a blind field duplicate sample of RM-MW8-SS1 (Duplicate #4). Results of laboratory analysis of soil samples from test pits and monitor wells completed at the site as part of the current investigation for petroleum hydrocarbon indicator compounds (TPH and BTEX) are presented in Table 5.1 in Appendix 5c, along with summary tables of results of petroleum hydrocarbon analysis for soils carried out as part of the previous Phase II ESA.

The corresponding analytical reports from Maxxam Analytics Inc. for petroleum hydrocarbon analysis in soil carried out during the current investigation are presented in Appendix 5d.

TPH were detected in eleven of the soil samples analyzed, returning values ranging from 25 mg/kg in soil sample RM-MW9-SS4 to 27,000 mg/kg in soil sample RM-TP7-BS4. No TPH was detected in soil sample RM-TP8-BS3. TPH was not analyzed in the laboratory duplicate soil sample of RM-TP7-BS4. The TPH concentrations detected in soil samples RM-TP6-BS4 and RM-TP7-BS4 exceeded the applicable Tier I RBSL for fuel and lube oil on a commercial site with non-potable groundwater and coarse soil (i.e., 7,400 mg/kg), returning values of 8,600 mg/kg and 27,000 mg/kg, respectively. Concentrations of TPH detected in the remaining soil samples analyzed at the site were below the applicable Tier I RBSL guidelines. Further, with the exception of soil samples RM-TP6-BS4 and RM-TP7-BS4, no concentrations of BTEX were detected in any of the other soil samples analyzed at the site. Low levels of toluene in soil sample RM-TP7-BS4 and ethylbenzene and xylenes in both soil samples RM-TP6-BS4 and RM-TP7-BS4 were within the applicable Tier I RBSL guidelines for each parameter. The Maxxam Analytics Inc. analytical report indicated that the products impacting soil samples at the site resembled a mixed assemblage of fuel oil, weathered fuel oil and lube oil.

3.7.8.2 PCBs in Soil

PCBs analysis was conducted on two soil samples including one each collected from test pits RM-TP3 and RM-TP9. Results of the laboratory analysis of these soil samples for PCBs are presented in Table 5.2 in Appendix 5c, along with summary tables of results of PCBs analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for PCBs analysis in soil carried out during the current investigation are presented in Appendix 5d.

No concentrations of PCBs were detected in any of the soil samples analyzed.

3.7.8.3 Cyanide in Soil

Total cyanide analysis was conducted on seven (7) soil samples, including one each from test pits RM-TP6 to RM-TP8 and monitor wells RM-MW5 to RM-MW7, as well as a blind field duplicate sample of RM-MW6-SS3 (Duplicate #3). Results of the laboratory analysis of these soil samples for total cyanide are presented in Table 5.3 in Appendix 5c, along with summary tables of results of total cyanide analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. for total cyanide analysis in soil carried out during the current investigation is presented in Appendix 5d.

Total cyanide was detected in five soil samples analyzed, returning values ranging from 1.3 mg/kg in soil sample RM-MW7-SS1 to 21 mg/kg in soil sample RM-TP8-BS1. No concentrations of total cyanide were detected in soil sample RM-MW6-BS3 and its duplicate. The concentrations of total cyanide detected in soil samples RM-TP6-BS4, RM-TP8-BS1 and RM-MW5-SS1 exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg, returning values of 17, mg/kg, 21 mg/kg and 8.9 mg/kg, respectively. Total cyanide was detected at the CCME guideline for free cyanide in soil on an industrial site in soil sample RM-TP7-BS2, returning a value of 8 mg/kg. The detected level of total cyanide in soil sample RM-MW7-SS1 was below the CCME guideline for cyanide in soil on an industrial site (i.e., 1.3 mg/kg versus a criteria of 8 mg/kg).

3.7.8.4 Petroleum Hydrocarbons in Groundwater

Petroleum hydrocarbon analysis was conducted on five groundwater samples, including one each from monitor wells RM-MW3, RM-MW4, and RM-MW7 to RM-MW9. Results of the laboratory analysis of these groundwater samples for petroleum hydrocarbon indicator compounds (TPH and BTEX) are presented in Table 5.4 in Appendix 5c, along with summary tables of results of petroleum hydrocarbon analysis for groundwater carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. is presented in Appendix 5d.

TPH was detected in all of the groundwater samples analyzed at the site, returning values ranging from 0.6 mg/L in RM-MW4 to 14 mg/L in RM-MW9. None of the concentrations of TPH detected in groundwater analyzed at the site exceeded the applicable Tier I RBSL for fuel/lube oil on a commercial site with non-potable groundwater and coarse soil (i.e., 20 mg/L). Various BTEX parameters were detected in all the groundwater samples analyzed at the site. However, none of the detected concentrations of BTEX parameters exceeded the applicable Tier I RBSLs for these parameters. The Maxxam Analytics Inc. analytical report indicated that the products impacting groundwater samples at the site resembled a mixed assemblage of fuel oil, weathered fuel oil and lube oil.

3.7.8.5 Cyanide in Groundwater

Total cyanide analysis was conducted on three groundwater samples, including one each collected from monitor wells RM-MW5 to RM-MW7. Results of laboratory analysis of these groundwater samples for total cyanide is presented in Table 5.5 in Appendix 5c, along with summary tables of results of total cyanide analysis for groundwater carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. for total cyanide analysis in groundwater carried out during the current investigation is presented in Appendix 5d.

Total cyanide was detected in all of the groundwater samples analyzed, returning values ranging from 0.01 mg/L in monitor well RM-MW5 to 0.072 mg/L in monitor well RM-MW7. The concentration of total cyanide detected in the groundwater sample collected from monitor well RM-MW7 exceeded the MOE groundwater standard for free cyanide of 0.052 mg/L, while the detected concentrations of cyanide in the other groundwater samples were below the MOE groundwater standard for this parameter.

3.7.9 Discussion & Conclusions of Phase III ESA

A Phase III ESA was completed in the Rambler Main Mine area at the Former Consolidated Rambler Mine property by Jacques Whitford on behalf of the Newfoundland and Labrador Department of Natural Resources - Mineral Development Division to further delineate environmental impacts identified in the previous Phase II ESA. The conclusions of this assessment are summarised below.

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised loose to dense brown grey sand and gravel (SP) with varying percentages of silt, cobbles and boulders overlying variably fractured grey to dark green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.4 mbgs in test pit RM-TP8 to greater than 4.57 m in monitor well RM-MW9.
2. Groundwater was encountered at depths ranging from 0.49 m to 1.89 m below the ground surface in the test pits and monitor wells completed at this site. Based on site topography and site observations, the direction of regional groundwater flow at the site is inferred to be north towards England's Steady. However, groundwater elevation data indicates local radial shallow



groundwater flow outwards from the mill building at the site, with groundwater flow direct determined to be toward the northeast in the vicinity of monitor wells RM-MW3, RM-MW4 and RM-MW5, towards the northwest in the vicinity of monitor well RM-MW6, and towards the southwest in the vicinity of monitor wells RM-MW7, RM-MW8 and RM-MW9.

3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA. However, during the current investigation, an oily sheen was observed on the surface of the groundwater in test pits RM-TP6 and RM-TP7, located on the west side of the mill building, and an oily residue was observed on the surface of bedrock in test pit RM-TP9, located in the fenced yard adjacent to the pad-mounted transformer, and on rock core recovered from monitor well RM-MW3, located adjacent to the generator and two 910 L ASTs present on the east side of the main mill building.
4. The detected TPH concentration in soil at test pits RM-TP6 and RM-TP7, located along the west side of the mill building exceeded the applicable Tier I RBSL for fuel oil on a commercial site with non-potable groundwater and coarse soil (i.e., 7,400 mg/kg). None of the detected concentrations of TPH in the other soil samples analyzed at the site during the current investigation exceeded the applicable Tier I RBSLs. Further, concentrations of BTEX in all soil samples analyzed were either non-detect or detected at levels below the applicable Tier I RBSLs for these parameters. The detected concentration of TPH in soil sample RMM-TP5-SS1, collected adjacent to and down-gradient of the generator and two 910 L ASTs present on the east side of the main mill building during the Phase II ESA exceeded the applicable Tier I RBSL for a commercial site, returning a value of 12,200 mg/kg.
5. The estimated extent of TPH in soil exceeding the Tier I RBSLs for a commercial site in the vicinity of test pits RM-TP6 and RM-TP7, located along the west side of the mill building, is shown on Drawing No. 1028976-EE-09 in Appendix 5a. The estimated area with TPH concentrations in soil above 7,400 mg/kg in this area is approximately 600 m². Based on field evidence of impacts and the noted depth to groundwater and bedrock in this area, it is expected that approximately 900 m³ of impacted soil in the vicinity of test pits RM-TP6 and RM-TP7 exceeds the applicable Tier I RBSL. Field and analytical evidence indicates that petroleum hydrocarbon impacts on average are present in the upper 1.5 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of petroleum hydrocarbon impacts in soil has been carried out the vicinity of test pits RM-TP6 and RM-TP7 and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates.
6. The estimated extent of TPH in soil exceeding the Tier I RBSLs for a commercial site in the vicinity of former test pit RMM-TP5 adjacent to and down-gradient of the generator and two 910 L ASTs present on the east side of the main mill building is shown on Drawing No. 1028976-EE-09 in Appendix 5a. The estimated area with TPH concentrations in soil above 7,400 mg/kg in the vicinity of former test pit RMM-TP5 is approximately 72 m². Based on field evidence of impacts and the noted depth to groundwater and bedrock in this area, it is expected that approximately 94 m³ of impacted soil in the vicinity of former test pit RMM-TP5 exceeds the applicable Tier I RBSL. Field and analytical evidence indicates that petroleum hydrocarbon impacts are present in the upper 1.3 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of petroleum hydrocarbon impacts in soil have been carried out in this area and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates.
7. Based on NLDEC policy directive PPD05-01, remediation of petroleum hydrocarbon impacted soil at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach,

remediation of petroleum hydrocarbon impacted site soil would be governed by site-specific threshold limit criteria determined for this contaminant.

8. The concentrations of total cyanide detected in soil at test pits RM-TP6, RM-TP7, and RM-TP8, located along the west side of the mill building, and soil at monitor well RM-MW5, located along the north side of the mill building, exceeded the CCME criteria for free cyanide in soil at an industrial site of 8 mg/kg. The concentration of total cyanide detected in soil at former test pit RMM-TP3, located along the west side of the main mill building in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, exceeded the CCME criteria for free cyanide in soil at an industrial site, returning a value of 21.0 mg/kg.
9. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, located along the west side of the mill building, is shown on Drawing No. 1028976-EE-10 in Appendix 5a. The estimated area with total cyanide concentrations in soil above 8 mg/kg in this area is approximately 2,000 m². Based on analytical evidence of impacts and the noted depth to bedrock in this area, it is expected that approximately 1,400 m³ of impacted soil in the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, exceeds the CCME criteria for free cyanide in soil on an industrial site. Analytical evidence indicates total cyanide impacts are present from surface to the base of the overburden layer in this area, which ranges in depth from 0.4 m to 1.8 m. An average depth of 0.7 m was assumed to estimate the impacted soil volume for this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of cyanide impacts in soil has been carried out the vicinity of test pits RM-TP6, RM-TP7, and RM-TP8, and former test pit RMM-TP3, and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
10. The estimated extent of total cyanide in soil exceeding the CCME criteria for free cyanide in soil on an industrial site in the vicinity of monitor well RM-MW5, located along the north side of the main mill building is shown on Drawing No. 1028976-EE-010 in Appendix 5a. The estimated area with total cyanide concentrations in soil above 8 mg/kg in this area is approximately 100 m². Based on analytical evidence of impacts and the noted depth to bedrock in this area, it is expected that approximately 100 m³ of impacted soil in the vicinity of monitor well RM-MW5 exceeds the CCME criteria for free cyanide in soil on an industrial site. Vertical delineation of total cyanide impacts in soil have not been carried out in this area, and it is assumed that total cyanide impacts are present in the upper 1 m of soil in this area. Most of the impacted soils in this area are readily accessible for removal, if required. Limited evaluation of cyanide impacts in soil has been carried out the vicinity of monitor well RM-MW5, and the actual impacted area may be smaller or larger than the estimated area. Additional delineation would be required to refine the impacted soil estimates. Further, analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in soil in this area. It is possible that the extent of free cyanide impacts in soil in this area is less than that determined for total cyanide.
11. The detected concentration of cyanide in groundwater from monitor well RM-MW7, located along the west side of the main mill building, exceeded the applicable MOE standard for free cyanide in groundwater of 0.052 mg/L. The concentration of cyanide detected in groundwater from former monitor well RMM-MW1 located in the northwest corner of the main mill building exceeded the applicable assessment criterion of 0.052 mg/L during the Phase II ESA, returning a value of 0.146 mg/L.

12. The estimated extent of total cyanide in groundwater exceeding the MOE standard for free cyanide in groundwater in the vicinity of monitor well RM-MW7, and former monitor well RMM-MW1 is shown on Drawing No. 1028976-EE-10 in Appendix 5a. Limited evaluation of cyanide impacts in groundwater have been carried out in this area, and additional delineation is required to confirm the extent of cyanide impacted groundwater in this area. The actual impacted area may be smaller or larger than the estimated area. Based on the available analytical, Jacques Whitford has estimated that an area of about 2,450 m² has total cyanide levels in groundwater above 0.052 mg/L. Analysis of specific cyanide species would be required to determine the actual extent of free cyanide impacts in groundwater in this area. It is possible that the extent of free cyanide impacts in groundwater in this area is less than that determined for total cyanide.
13. Based on NLDEC policy directive PPD05-01, remediation of total cyanide impacted soil and groundwater at the site would be required in accordance with provincial regulations, unless a risk-based remedial approach is followed for the site. Adopting a risk-based remedial approach, remediation of total cyanide impacted site soil and groundwater would be governed by site-specific threshold limit criteria determined for this contaminant.

3.8 Rambler Main Mine Area - Hazardous Materials Assessment

The following buildings in the Rambler Main Mine were assessed as part of the Hazardous Materials Assessment:

- Mill Building
- Crusher Building
- Chemistry Laboratory
- Maintenance Garage
- Storage Shack
- Hoist Building
- Storage Shed
- Core Shack
- Refuelling Station
- Security Shed
- Weigh Scales

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interiors of the Main Office, Chemistry Laboratory, Mill Building, Weigh Scales and the Storage Shed were not accessed due to either the poor structural condition of the buildings or suspect unsafe conditions due to unknown chemical storage.

3.8.1.1 Previous Work

No previous work for asbestos was completed in the Rambler Main Mine Area.

3.8.1.2 Phase III ESA Asbestos Survey Scope and Methodology

The Asbestos Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Five potential ACMs were observed in the subject buildings. During the sampling, a visual determination of the condition of the material, the accessibility, contact potential, exposure, and friability was made in the building. All materials were observed to be in poor condition at the time of the assessment.

Upon entry into each room, a visual identification of both friable (i.e., can easily be crumbled or pulverized by manual pressure) and non-friable potential ACMs was performed. The specifics of the potential ACMs including their condition, location and degree of friability were documented.

The following definitions were used in assessing the degree of friability and condition of ACMs:

Friability:

- HIGH** Readily releases airborne fibres where brushed against or otherwise disturbed (i.e., sprayed fireproofing, stipple)
- MEDIUM** Stable if left untouched or protective coating is undisturbed. However, easily releases airborne fibres once the protective coating is punctured or otherwise damaged (i.e., aircell pipe insulation, magblock boiler insulation)
- LOW** Stable if left untouched or protective coating is undisturbed. Requires some degree of effort to release airborne fibres once the protective coating is damaged or otherwise disturbed (i.e., parging on pipe elbows, fittings and valves, gaskets, suspended ceiling tiles)
- NONE** Asbestos fibres contained in a stable matrix, unlikely to release airborne asbestos if damaged or otherwise disturbed (i.e., floor tile, drywall joint filler compound, plaster, hardboard, exterior shingles)

Condition:

- GOOD** No exposed friable ACMs, protective coating not damaged
- FAIR** Minor damages to protective coating or exposure of ACMs
- POOR** Damaged or fallen asbestos material, hazard of worker exposure to asbestos

The survey and sampling of ACMs was generally limited to readily visible or easily accessible materials inside or on the subject buildings. At the time of the site visit, the interior areas of all of the buildings were not completely accessible to Jacques Whitford for inspection due to the poor structural condition of the buildings or the suspect unsafe conditions due to unknown chemical storage. There was limited intrusive sampling conducted within wall cavities as ACMs were not expected to be within the wall cavities. The asbestos assessment did not include any intrusive sampling of the roofing materials on the buildings.

3.8.1.3 Results

During the site inspection, five (5) bulk samples of possible ACMs were collected from the Security Shed, the Mill Building, the Hoist Building and the Main Office (JW07-RMM-ASB1 to JW07-RMM-ASB5). The bulk samples were sent to Maxxam Analytics Inc. for confirmatory asbestos analysis.



Asbestos was not confirmed to be present in JW07-RMM-ASB2, a sample of exterior siding from the Mill Building and JW07-RMM-ASB4, a sample of ceiling tile from the Main Office. Sample JW07-RMM-ASB1 (brown/beige floor covering from the Security Shed) was found to contain 1-5% chrysotile asbestos. Sample JW07-RMM-ASB3 (aircell pipe insulation from the Hoist Building) was found to contain 10-20% chrysotile asbestos. Sample JW07-RMM-ASB (brown/beige floor covering from the Main Office) was found to contain 1-5% chrysotile asbestos. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted, the sample analyses and the locations of visually similar materials is included in Table 5.6 in Appendix 5c. The locations where the bulk samples were collected are noted on Drawing No. 1028976-EE-11 in Appendix 5a.

3.8.1.4 Discussion and Recommendations

Friable ACMs

Based on the results of the Phase III ESA, friable asbestos was confirmed to be present in the Hoist Building which included pipe insulation (approximately 50 m in poor condition).

Non-Friable ACMs

Based on the results of the Phase III ESA, non-friable asbestos was confirmed to be present in the buildings and included brown/beige floor covering from the Security Shed (approximately 10 m² in poor condition) and brown/beige floor covering from the Main Office (approximately 200 m² in poor condition).

Other Possible ACMs

No other ACMs are expected to be present in concealed wall or ceiling spaces of the buildings.

The management of asbestos-containing materials and the handling, removal and disposal of asbestos-containing materials in the buildings are to be carried out in accordance with the Newfoundland Asbestos Abatement Regulations 1998. An asbestos management action plan should be developed for the site buildings in the Rambler Main Mine.

3.8.2 Lead, Mercury & PCBs Based Paints

3.8.2.1 Previous Work

No previous work for lead, mercury and PCBs in paint was completed in the Rambler Main Mine area.

3.8.2.2 Phase III ESA Paint Survey Scope and Methodology

The Paint Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. During the site inspection, ten (10) paint samples were collected. The bulk samples were sent to Maxxam Analytics Inc. for lead and mercury analyses. Samples JW07-RMM-PS2, JW07-RMM-PS4, JW07-RMM-PS6, JW07-RMM-PS8 and JW07-RMM-PS10 were also sent for PCB analysis. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted and the sample analyses is included in Table 5.7 in Appendix 5c. The locations where the bulk samples were collected are noted on the Drawing No. 1028976-EE-11 in Appendix 5a.

3.8.2.3 Results

The samples collected included turquoise paint on exterior trim (JW07-RMM-PS1) and interior white paint on drywall (JW07-RMM-PS2) within the Main Office, blue paint on plywood walls (JW07-RMM-PS3), yellow paint on plywood walls (JW07-RMM-PS4) and white paint on plywood walls (JW07-RMM-PS5) within the Security Shed, green paint on exterior doors (JW07-RMM-PS6) and exterior beige paint on siding (JW07-RMM-PS7) on the Mill Building, interior turquoise paint on drywall within the Core Shack (JW07-RMM-PS8), exterior yellow paint on the siding of the Hoist Building (JW07-RMM-PS9) and exterior red paint on the roof of the Hoist Building (JW07-RMM-PS10).

The concentrations of lead detected in four of the paint samples were above the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. These samples include the turquoise paint on exterior trim (JW07-RMM-PS1) on the Main Office, blue paint on plywood walls (JW07-RMM-PS3) and yellow paint on plywood walls (JW07-RMM-PS4) within the Security Shed and green paint on exterior doors (JW07-RMM-PS6) on the Mill Building. These bulk samples of paint were analyzed for lead leachability. The concentration of lead leachate in the sample from the turquoise paint on exterior trim on the Main Office (9.4 mg/L) was in excess of 5 mg/L and, therefore, is considered to be leachable and is hazardous materials for disposal purposes.

The concentrations of mercury detected in the paint samples were all below the Federal HPA criterion of 10.0 mg/kg and are therefore not considered to be a health hazard during any renovation/demolition activities at the Site.

PCBs were not detected in the paint samples that were analyzed.

3.8.2.4 Discussion and Recommendations

Based on the results of the sampling and analysis, elevated lead concentrations (i.e., greater than 600 mg/kg) are present in the turquoise paint on exterior trim on the Main Office; blue paint on plywood walls and yellow paint on plywood walls within the Security Shed; and, green paint on exterior doors on the Mill Building. Results revealed that the concentration of lead leachate in the sample from the turquoise paint on exterior trim on the Main Office (9.4 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, this paint, if removed from the Site, must be disposed of as hazardous waste.

Based on the results of the sampling and analysis, elevated mercury concentrations (i.e., greater than 10 mg/kg) and elevated PCB concentrations (i.e., greater than 33 mg/kg) were not present in paint samples submitted from the Rambler Main Mine site. Therefore, these paints (other than the turquoise paint on exterior trim on the Main Office), if removed from the Site, may be disposed of at an approved landfill facility.

The paints in the Rambler Main Mine area were in generally good to poor condition. Lead containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting. Lead based paints that are in poor condition may pose health concerns for building occupants. Lead based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.



3.8.3 Polychlorinated Biphenyls (PCBs)

Based on observations during the previous Phase I and II ESAs, as well as observations during the current investigation, electrical equipment, which could contain PCBs, and potential PCBs observed on the site includes a pad-mounted transformer located approximately 30 m east of the security shed, a pole-mounted transformer between the security shed and the pad-mounted transformer and a potential PCBs and reagent storage area located on the east side of the main mill building storage area. During the current investigation, a number of transformers, switchgears and other electrical equipment were stored in the Hoist Building, most of which appeared to have been drained of their dielectric fluids and the interior cores removed.

The PCB inspection, including a limited random inspection of any older looking fluorescent light ballasts in the site buildings. The ballasts to be inspected were selected based on safe accessibility and apparent age. Three safely accessible fluorescent light ballasts were found in the Main Office during the site visit and were checked for the presence of PCBs.

The manufacturer's name, manufacturer's code (if present), and date code (if present) were recorded for the inspected ballasts. The information obtained from the light ballasts was compared (if necessary) to information in an Environmental Protection Services report EPS 2/CC/2 *Identification of Lamp Ballasts Containing PCBs* to determine whether or not the ballasts contain PCBs. All lights were put back into service, following the inspection.

Manufacturer's codes and date codes are not always legible on fluorescent light ballasts. If there is a mixture of older PCB-containing light ballasts and newer PCB-free light ballasts in a building, and it is not possible to read the manufacturer's codes or date codes on a particular ballast, it is good environmental practice that the subject ballast be considered to contain PCBs.

Table 4 Results of Inspection of Fluorescent Light Ballasts

Ballast Location	Observed Manufacturer's Information	PCB Status
Main Office	Phillips Non-PCB	Based on the manufacturer's markings the ballast does not contain PCBs.
Main Office	Magnetek	Unclear if the ballast contains PCBs.
Main Office	Sola Basic Limited	Unclear if the ballast contains PCBs.

The results of a limited inspection of light ballasts can be used to evaluate the presence of PCB ballasts in a building. If the apparently oldest ballasts on a floor of a building do not contain PCBs, then it is likely that none of the ballasts on the floor contain PCBs. If any of the inspected ballasts on a floor of a building contain PCBs, then all ballasts on that floor of the building must either be inspected or be treated as though they contain PCBs.

Based on the available information and the observations from the limited inspections, it is possible that PCB-containing fluorescent light ballasts are located in the buildings. It is recommended that all ballasts within the buildings be inspected upon removal or be treated as though they contain PCBs. The removal and handling of the ballasts will have to be addressed as part of a remedial action plan for the site. This may include further inspection of ballasts prior to demolition if areas of site buildings are determined to be safe and/or the removal and handling of ballasts as part of demolition debris.

3.8.4 Other Identified Hazardous Materials

Based on observations during the previous Phase I and II ESA, as well as observations during the current investigation, other identified hazardous materials include a storage shack containing five 45-gallon drums (full) of an unknown substance on the southeast corner of the main mill building, an empty 45-gallon drum labeled cyanide present near a partially opened door on the west side of the main mill building, three empty deteriorated 45-gallon drums on the southwest corner of the Chemical Laboratory, as well as a large quantity of product samples and laboratory chemicals and reagents present within the chemical laboratory. Unknown chemicals were observed within the Hoist Building and the Main Office. A strong chemical odour was also present at the entrance to the Mill Building at the time of the site visit. The Mill Building was not entered during the current investigation.

3.8.5 Mold

Except for within the Main Office, no other extensive water damaged building materials or suspect mold growth was observed within the buildings.

3.9 Bunkhouse Area – Phase III ESA

3.9.1 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 (as shown on Drawing No. 1028976-EE-12 in Appendix 6a). All Site buildings were observed to be in poor condition at the time of the site inspection. Other site features and infrastructure include two pole-mounted transformers, an oil stove, several propane tanks and a partially buried underground storage tanks (UST). During the current investigation, the two pole-mounted transformers appeared to have been cut-down, drained of their dielectric fluids and the interior cores removed.

In addition a wooden platform, possibly a former AST holding pad, is present on the southwest corner of the cookhouse, and a discarded UST is present in the woods approximately 20 m south of the staff house.

Terrain in the area is generally flat to gently to moderately sloping towards the south and north. Surface drainage (apparent groundwater flow direction) appears to follow the general slope, in the southern portion of the site flowing towards Rambler Brook, located approximately 30 m south of the site, and flowing north towards England Steady in the northern portion of the site.

3.9.2 Previous Work

The Phase II ESA previously completed in the Bunkhouse area included the excavation of thirteen (13) test pits, and the collection of soil samples for chemical analysis of petroleum hydrocarbons, PCBs and lead. The sampling locations for soils collected as part of the previous Phase II ESA are shown on Drawing No. 1028976-EE-12 in Appendix 6a, and summary tables of results of laboratory analysis are provided in Appendix 6c. The results of the Phase II ESA in the Bunkhouse area can be summarized as follows:



- Concentrations of petroleum hydrocarbons, PCBs and lead in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.

3.9.3 Field Work

Fieldwork carried out in the Bunkhouse Area during the current investigation comprised excavation of two (2) test pits and completion of two (2) monitor wells. A site and sample location plan (Drawing No. 1028976-EE-12) showing the location of these, as well as general site features and former Phase II ESA sample locations is provided in Appendix 6a.

3.9.4 Stratigraphy

The stratigraphic information recorded during the current investigation is presented on the Test Pit and Monitor Well Records in Appendix 6b. Possible natural glacial till material was encountered at or near the surface at all test pit and monitor well locations and ranged in thickness from 0.3 mbgs in test pit RM-TP2 to 3.2 m in monitor well RM-MW2. Till material generally comprised loose to dense grey brown sand and gravel with varying percentages of clay, silt, and cobbles.

Bedrock was encountered at the base of both test pits investigated at the site, as well as beneath the till material in monitor wells RM-MW1 and RM-MW2 and comprised a greyish-green felsic and mafic volcanic rocks.

3.9.5 Groundwater Conditions

The depth to the groundwater table as measured on September 20, 2007 in monitor wells RM-MW1 and RM-MW2 was 1.79 m and 1.92 m, respectively. Groundwater levels in these monitor wells are expected to vary seasonally and in response to individual precipitation events.

No groundwater seepage was encountered in test pits RM-TP1 and RM-TP2 at the time of excavation and backfilling. Test pits are not normally left open long enough for groundwater levels to stabilise in the excavations, therefore groundwater level estimates at these locations have to be considered with caution.

Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow in the Bunkhouse area. However, based on local topography and site observations, the direction of groundwater flow in the southern portion of the site is inferred to be southwards towards Rambler Brook and the direction of groundwater flow in the northern portion of the site is inferred to be northwards towards Englands Steady. The inferred directions of shallow groundwater flow at the site are shown on Drawing No. 1028976-EE-12 in Appendix 6a.

3.9.6 Free Liquid Phase Petroleum Hydrocarbons

No free liquid phase petroleum hydrocarbons were observed at this site during the current investigation or the previous Phase II ESA.

3.9.7 Soil Vapor Concentrations

The soil vapour concentrations measured in each of the soil samples from the test pits are provided on the Test Pit Records in Appendix 6b. The vapour concentrations measured ranged from 1.2 to 6.8 ppm. The soil vapour concentrations measured in each of the soil samples from the monitor wells are provided on the Monitor Well Records in Appendix 6b. The vapour concentrations measured ranged from 3.6 to 21.7 ppm.

Soil vapour concentrations vary with both fuel type and age, and it should be noted that the readings are intended to provide only a qualitative indication of volatile hydrocarbon levels and are not directly equivalent to soil analytical results. Soil vapor concentrations which exceed 50 ppm may indicate the presence of petroleum hydrocarbon impacts in soil. No soil vapour concentrations above 50 ppm were measured in any of the soil samples collected from test pits and monitor wells at the site.

Petroleum hydrocarbon odours were not detected in any of the test pits or monitor wells completed at the site during the current investigation. A strong petroleum hydrocarbon odour was detected during the excavation of former test pit BH-TP5 during the previous Phase II ESA.

3.9.8 Soil Chemical Analysis & Results

A laboratory analysis schedule for the Bunkhouse Area is presented in Table 5.

Table 5 Laboratory Analysis Schedule (Bunkhouse Area)

Potential Environment Concern	Sample Location	Sample Matrix	
		Soil	Groundwater
Potential for petroleum hydrocarbon impacts related to historical storage and usage	RM-TP1, RM-TP2, RM-MW1, RM-MW2	4	2
Potential for PCBs impacts related to transformer oil spills	RM-TP1 & RM-TP2	2	-
Note: The methodologies utilised by Maxxam Analytics Inc. in analysis of the soil and groundwater samples are presented on the analytical reports in Appendix 6d.			

Results of the laboratory analysis of soil samples obtained from this site are presented in Tables 6.1 to 6.3 in Appendix 6c, along with applicable summary tables of results of chemical analysis for soil carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for the current investigation are presented in Appendix 6d.

3.9.8.1 Petroleum Hydrocarbons in Soil

Petroleum hydrocarbon analysis was conducted on six soil samples, including one each from test pits RM-JW07-TP1 and RM-JW07-TP2 and monitor wells RM-JW07-MW1 and RM-JW07-MW2, as well as a laboratory QA/QC duplicate sample and a blind field duplicate sample of RM-JW07-MW1-SS4 (Duplicate #2). Results of laboratory analysis of soil samples from test pits and monitor wells completed at the site as part of the current investigation for petroleum hydrocarbon indicator compounds (TPH and BTEX) are presented in Table 6.1 in Appendix 6c, along with summary tables of results of petroleum hydrocarbon analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical reports from Maxxam Analytics Inc. for petroleum hydrocarbon analysis in soil carried out during the current investigation are presented in Appendix 6d.

TPH were detected in two of the soil samples analyzed, returning values of 27 mg/kg for soil sample RM-JW07-TP2-BS1 and 2,500 mg/kg for soil sample RM-JW07-MW2-SS3. No concentrations of TPH were detected in the remaining soil samples analyzed at the site. TPH was not analyzed in the laboratory duplicate soil sample of RM-JW07-MW1-SS4. The concentrations of TPH detected in soil samples RM-JW07-TP2-BS1 and RM-JW07-MW2-SS3 were below the applicable Tier I RBSL for fuel and lube oil on a commercial site with non-potable groundwater and coarse soil (i.e., 7,400 mg/kg). Further, no concentrations of BTEX were detected in any of the soil samples analyzed at the site. The Maxxam Analytics Inc. analytical report indicated that the products impacting soil samples at the site resembled weathered fuel oil.

3.9.8.2 Polychlorinated Biphenyls in Soil

PCBs analysis was conducted on three soil samples including one each collected from test pits RM-JW07-TP1 and RP-JW07-TP2, as well as a laboratory QA/QC duplicate sample of RM-JW07-TP1-BS2. Results of the laboratory analysis of these soil samples for PCBs are presented in Table 6.2 in Appendix 6c, along with summary tables of results of PCBs analysis for soils carried out as part of the previous Phase II ESA. The corresponding analytical report from Maxxam Analytics Inc. for PCBs analysis in soil carried out during the current investigation is presented in Appendix 6d.

PCBs were detected in soil sample RM-JW07-TP1-BS2 and its duplicate at concentrations of 0.11 mg/kg and 0.14 mg/kg, respectively. The concentrations of PCBs detected in soil sample RM-JW07-TP1-BS2 and its duplicate is below the applicable CCME criteria for PCBs in soil at an industrial site of 33 mg/kg. No concentration of PCBs was detected in soil sample RM-JW07-TP2-BS1.

3.9.8.3 Petroleum Hydrocarbons in Groundwater

Petroleum hydrocarbon analysis was conducted on two groundwater samples, including one each from monitor wells RM-JW07-MW1 and RM-JW07-MW2. Results of the laboratory analysis of these groundwater samples for petroleum hydrocarbon indicator compounds (TPH and BTEX) are presented in Table 6.3 in Appendix 6c. The corresponding analytical report from Maxxam Analytics Inc. for petroleum hydrocarbon analysis in groundwater carried out during the current investigation is presented in Appendix 6d.

TPH was detected in both groundwater samples analyzed at the site, returning values of 0.3 mg/L for monitor well RM-JW07-MW1 and 16 mg/L for monitor well RM-JW07-MW2. None of the concentrations of TPH detected in groundwater analyzed at the site exceeded the applicable Tier I RBSL for fuel/lube oil on a commercial site with non-potable groundwater and coarse soil (i.e., 20 mg/L). Various BTEX parameters were detected in both groundwater samples analyzed at the site. However, none of the detected concentrations of BTEX parameters exceeded the applicable Tier I RBSLs for these parameters. The Maxxam Analytics Inc. analytical report indicated that the products impacting groundwater samples at the site resembled a mixed assemblage of fuel oil, weathered fuel oil and lube oil.

3.9.9 Discussion & Conclusions of Phase III ESA

A Phase III ESA was completed in the Bunkhouse area at the Former Consolidated Rambler Mine property by Jacques Whitford on behalf of the Newfoundland and Labrador Department of Natural Resources - Mineral Development Division to further delineate environmental impacts identified in the previous Phase II ESA. The conclusions of this assessment are summarised below.

1. The stratigraphy observed on the site was generally similar at all test pit and monitor well locations and comprised comprised comprised loose to dense grey brown sand and gravel till with varying percentages of clay, silt, and cobbles overlying greyish green mafic and felsic volcanic rocks. Depth to bedrock ranged from 0.3 mbgs in test pit RM-TP2 to 3.2 m in monitor well RM-MW2.
2. Groundwater was encountered at depths of 1.79 m and 1.92 m below the ground surface in monitor wells RM-MW1 and RM-MW2, respectively. No groundwater seepage was encountered in any of the test pits completed at the site. Groundwater elevation data from a minimum of three monitor wells is required to determine the direction of groundwater flow at the site. However, based on local topography and site observations, the direction of groundwater flow in the southern portion of the site is inferred to be southwards towards Rambler Brook and the direction of groundwater flow in the northern portion of the site is inferred to be northwards towards Englands Steady.
3. No free liquid phase petroleum hydrocarbons were observed at the site during the current investigation or the previous Phase II ESA.
4. Concentrations of petroleum hydrocarbons and PCBs in all soil samples and the concentration of petroleum hydrocarbons in all groundwater samples analyzed were either non-detect or detected at levels below the applicable assessment criteria, and are thus not considered to be an environmental concern in evaluated areas of the site.

3.10 Bunkhouse Area - Hazardous Materials Assessment

The following buildings in the Bunkhouse Area were assessed as part of the Hazardous Materials Assessment:

- Cookhouse
- 2 – Bunkhouses
- Staff Housing Unit

Visual inspections and bulk sampling were carried out and were limited to safely and readily accessible portions of the site buildings, facilities and equipment. The interiors of the buildings were not completely accessed due to the poor structural condition of the buildings.

3.10.1.1 Previous Work

No previous work for asbestos was completed in the Bunkhouse Area.

3.10.1.2 Phase III ESA Asbestos Survey Scope and Methodology

The Asbestos Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. Five potential ACMs were observed in the subject buildings. During the sampling, a visual determination of the condition of the material, the accessibility, contact potential, exposure, and friability was made in the building. All materials were observed to be in poor condition at the time of the assessment.

Upon entry into each room, a visual identification of both friable (i.e., can easily be crumbled or pulverized by manual pressure) and non-friable potential ACMs was performed. The specifics of the potential ACMs including their condition, location and degree of friability were documented.

The following definitions were used in assessing the degree of friability and condition of ACMs:

Friability:

- HIGH** Readily releases airborne fibres where brushed against or otherwise disturbed (i.e., sprayed fireproofing, stipple)
- MEDIUM** Stable if left untouched or protective coating is undisturbed. However, easily releases airborne fibres once the protective coating is punctured or otherwise damaged (i.e., aircell pipe insulation, magblock boiler insulation)
- LOW** Stable if left untouched or protective coating is undisturbed. Requires some degree of effort to release airborne fibres once the protective coating is damaged or otherwise disturbed (i.e., parging on pipe elbows, fittings and valves, gaskets, suspended ceiling tiles)
- NONE** Asbestos fibres contained in a stable matrix, unlikely to release airborne asbestos if damaged or otherwise disturbed (i.e., floor tile, drywall joint filler compound, plaster, hardboard, exterior shingles)

Condition:

- GOOD** No exposed friable ACMs, protective coating not damaged
- FAIR** Minor damages to protective coating or exposure of ACMs
- POOR** Damaged or fallen asbestos material, hazard of worker exposure to asbestos

The survey and sampling of ACMs was generally limited to readily visible or easily accessible materials inside or on the subject buildings. At the time of the site visit, the interiors of the buildings were not completely accessed due to the poor structural condition of the buildings. There was limited intrusive sampling conducted within wall cavities as ACMs were not expected to be within the wall cavities. The asbestos assessment did not include any intrusive sampling of the roofing materials on the buildings.

3.10.1.3 Results

During the site inspection, five (5) bulk samples of possible ACMs were collected from Bunkhouse No. 1, the Cookhouse and the Staff Housing Unit (JW07-BHA-ASB1 to JW07-BHA-ASB5). The samples included beige/brown floor covering (JW07-BHA-ASB1) and drywall joint compound (JW07-BHA-ASB2) from Bunkhouse No. 1, beige/brown floor covering (JW07-BHA-ASB3) and drywall joint compound (JW07-BHA-ASB4) from the Cookhouse and drywall joint compound (JW07-BHA-ASB5) from the Staff Housing Unit. The bulk samples were sent to Maxxam Analytics Inc. for confirmatory asbestos analysis. Asbestos was not confirmed to be present in any of the samples. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted, the sample analyses and the locations of visually similar materials is included in Table 6.4 in Appendix 6c. The locations where the bulk samples were collected are noted on Drawing No. 1028976-EE-13 in Appendix 6a.

3.10.1.4 Discussion and Recommendations

Friable ACMs

Based on the results of the Phase III ESA, friable asbestos was not confirmed to be present in the buildings in the Bunkhouse Area.

Non-Friable ACMs

Based on the results of the Phase III ESA, non-friable asbestos was not confirmed to be present in the buildings in the Bunkhouse Area.

Other Possible ACMs

No other ACMs are expected to be present in concealed wall or ceiling spaces of the buildings.

3.10.2 Lead, Mercury & PCBs Based Paints

3.10.2.1 Previous Work

No previous work for lead, mercury and PCBs in paint was completed in the Bunkhouse Area.

3.10.2.2 Phase III ESA Paint Survey Scope and Methodology

The Paint Survey was conducted from September 4 to 21, 2007 by Steve Moores, a Jacques Whitford senior environmental technician. During the site inspection, three (3) paint samples were collected. The bulk samples were sent to Maxxam Analytics Inc. for lead and mercury analyses. Samples JW07-BHA-PS1 and JW07-BHA-PS3 were also sent for PCB analysis. Detailed laboratory test results are included in Appendix 7. A summary of the bulk samples submitted and the sample analyses is included in Table 6.5 in Appendix 6c. The locations where the bulk samples were collected are noted on Drawing No. 1028976-EE-13 in Appendix 6a.

3.10.2.3 Results

The samples collected included interior green on white paint on drywall in Bunkhouse No.1 (JW07-BHA-PS1) and interior white on pink/orange paint on drywall within the Cookhouse (JW07-BHA-PS2) and interior white on green paint on drywall within the Staff Housing Unit (JW07-BHA-PS3).

The concentrations of lead detected in two of the paint samples were above the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. These samples include the interior green on white paint on drywall in Bunkhouse No. 1 (JW07-BHA-PS1) and interior white on pink/orange paint on drywall within the Cookhouse (JW07-BHA-PS2). These bulk samples of paint were analyzed for lead leachability. The concentrations of lead leachate in the samples were not in excess of 5 mg/L and, therefore, are not considered to be leachable and are not hazardous materials for disposal purposes.

The concentration of mercury detected in one of the three paint samples (JW07-BHA-PS1, a sample of the interior green on white paint on drywall in Bunkhouse No. 1) was above the Federal HPA criterion of 10.0 mg/kg and is, therefore, considered to be a health hazard during any renovation/demolition activities at the Site. This bulk sample of paint with a mercury concentration above 10.0 mg/kg was analyzed for mercury leachability. The concentration of mercury leachate in the sample was in excess



of 0.1 mg/L and, therefore, is considered to be leachable and is a hazardous material for disposal purposes.

PCBs were not detected in the paint samples that were analyzed.

3.10.2.4 Discussion and Recommendations

Based on the results of the sampling and analysis, elevated lead concentrations (i.e., greater than 600 mg/kg) are present in the interior green on white paint on drywall in Bunkhouse No. 1 (JW07-BHA-PS1) and the interior white on pink/orange paint on drywall within the Cookhouse (JW07-BHA-PS2). The concentrations of lead leachate in the samples were not in excess of 5 mg/L and, therefore, are not considered to be leachable and are not hazardous materials for disposal purposes.

Based on the results of the sampling and analysis, an elevated mercury concentration (i.e., greater than 10 mg/kg) is present in the interior green on white paint on drywall in Bunkhouse No. 1. Results revealed that the concentrations of mercury leachate detected in the paint sample did exceed the applicable assessment criterion of 0.1 mg/L. Therefore, this paint, if removed from the Site, is considered to be leachable and is a hazardous material for disposal purposes.

Based on the results of the sampling and analysis, elevated PCB concentrations (i.e., greater than 33 mg/kg) were not present in paint samples submitted from the Bunkhouse Area.

The paints in the Bunkhouse Area were in generally poor condition. Lead and Mercury containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting. Lead and Mercury based paints that are in poor condition may pose health concerns for building occupants. Lead and Mercury based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.

3.10.3 Polychlorinated Biphenyls (PCBs)

No electrical transformers, which could contain PCBs, were observed in the accessed areas of the buildings. Two former pole-mounted transformers were observed on the site. The pole-mounted transformers were found on the ground surface and were apparently empty. As part of the Phase III ESA scope of work, two test pits were placed in the areas of the transformers. Soil samples were collected from the test pits and analyzed for PCBs. The results of the analyses are discussed in Section 3.9.8.2 above.

No fluorescent light fixtures were observed within the accessed areas of the buildings.

3.10.4 Other Identified Hazardous Materials

No other identified hazardous materials were observed within the buildings.

3.10.5 Mold

Extensive water damage was observed within the all of the buildings. Extensive mold growth is suspected due to the extent of water damage and porous nature of the building materials, but could not be observed.



4.0 RECOMMENDATIONS

4.1 Phase III Environmental Site Assessment

The Phase III ESA investigation completed by Jacques Whitford was carried out as a follow up to a Phase II ESA previously conducted on the property by AMEC in 2006/2007, and its purpose was to further delineate the noted environmental site impacts identified during the Phase II ESA following the Phase III ESA sampling plan recommended in the Phase II ESA report. Jacques Whitford's Phase III ESA did not include further evaluation of various other contaminants identified on the property during the previous Phase II ESA, including metals and acid impacts in soil, groundwater, surface water, freshwater sediments and stockpiled tailings. Further, the former Consolidated Rambler Mine property is a large, complex site with a long history of industrial site usage, and it is possible that other environmental impacts are present on the site that have not been identified that may be discovered during decommissioning activities and may require future evaluation. Based on information provided by DNR-MDD, Jacques Whitford understands that a future limited industrial land use is intended for the Former Consolidated Rambler Mine Property.

Based on results of environmental site assessment work completed on the property to date, Jacques Whitford makes the following recommendations:

1. Decide whether to carry out conventional soil remediation (i.e., removal of impacted soil from the site for off-site disposal or treatment) or risk management (i.e., impacted soil is left in place and managed) or a combination of both approaches for petroleum hydrocarbon impacted soil identified in the Rambler Main Mine Area, and for cyanide impacted soil and groundwater identified in the Rambler Main Mine Area, and for cyanide impacted soil identified in the Raymo Processing Facility Area. Under a risk-management approach the site owner maintains the long-term liability for the impacts on the site.
2. Analytical results for total cyanide in soil and groundwater obtained during the current investigation and previous Phase II ESA provide conservative estimates of cyanide impacts in soil and groundwater on the property. Any future delineation of cyanide in soil and groundwater on the property should also involve species specific analysis of cyanide, including free cyanide, which may reduce area and volume estimates of cyanide impacted soil and groundwater provided in this report.
3. If the usage of a risk-management approach is acceptable to the site owner, carry out a human health risk assessment and a screening level ecological risk assessment for petroleum hydrocarbons and cyanide in the Rambler Main Mine Area, and for cyanide in the Raymo Processing Facility Area. Dependent on the results of the screening level ecological risk assessment, additional ecological assessment could be required for portions of the property. Dependent on the results of the risk assessments, risk management or remedial action may be required for portions of the property.
4. Once the site owner makes a decision with respect to the future usage of the various portions of the property and whether to use a conventional remediation approach or a risk-management approach, develop a remedial action plan and/or a risk management plan for the study area. Submit the remedial action plan and/or risk management plan to the NLDEC for review and approval before implementing on the study area.
5. No additional work was carried out as part of the current investigation to further delineate the extent of metals impacts identified in soil in the East Mine Area, and in soil and groundwater in the Raymo Processing Area and Rambler Main Mine area during the Phase II ESA. The Phase



II ESA indicates that metals impacts in soil are widespread throughout the site and likely reflect background geology conditions in the area. However, background soil sampling should be considered in order to provide metals chemistry results that are representative of natural conditions for comparison to evaluate the environmental significance of soil metals results from portions of property. In addition, background surface water and freshwater sediment sampling should be considered to evaluate the environmental significance of metals results for surface water and freshwater sediment samples collected from various sites on the property. Background metals sampling would also be required if a risk assessment/risk management approach is adopted for the property, as per Health Canada guidance.

6. In accordance with NLDEC policy directive PPD05-01, remediation of the metals impacted soil, freshwater sediment and surface water would be required unless a risk-based remedial approach is developed and approved for the property or the source of the metals impacts is shown to be natural in origin, demonstrated through background sampling.
7. No additional work was carried out as part of the current investigation to further evaluate levels of metals, cyanide and pH identified in sediment, and surface and groundwater in the Tailings Area during the Phase II ESA, as well as pH levels in soil, freshwater sediment and surface and groundwater in other portions of the property, as well as potential metals, cyanide and pH impacts along access roads with acid-generating rock cover materials. However, based on regulatory requirements, future environmental sampling for these parameters may be required in these areas. If an ecological risk assessment is to be conducted, detailed sampling of soil, sediment, and surface water and groundwater media for these parameters would likely be required.
8. All ASTs and USTs and associated pipelines identified at the site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
9. 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.

4.2 Hazardous Materials Assessment

Based on the results of the current investigation, Jacques Whitford makes the following recommendations:

1. Based on the results of the Phase II and III ESAs, friable asbestos building materials were confirmed to be present in some areas of the Former Consolidated Rambler Copper Mine. Non-friable asbestos was also confirmed to be present in some of the buildings on the site.
2. The management of asbestos-containing materials and the handling, removal and disposal of asbestos-containing materials from the buildings are to be carried out in accordance with the Newfoundland Asbestos Abatement Regulations 1998. An asbestos management action plan should be developed for the Former Consolidated Rambler Copper Mine to include options for the removal, management, handling and/or disposal of asbestos containing building materials.
3. Elevated lead concentrations (i.e., greater than 600 mg/kg) are present in paints throughout the Former Consolidated Rambler Copper Mine. Elevated mercury concentrations (i.e., greater than 10 mg/kg) are also present in paints throughout the Site.
4. Lead based paints and painted building materials that have a lead leachate concentration of less than the applicable assessment criterion of 5.0 mg/L may be disposed of at an approved landfill if removed from the Site. Mercury based paints and painted building materials that have

a mercury leachate concentration of less than the applicable assessment criterion of 0.1 mg/L may also be disposed of at an approved landfill if removed from the Site. PCB based paints and painted building materials that have a PCB leachate concentration of less than the applicable assessment criterion of 0.3 mg/L may also be disposed of at an approved landfill if removed from the Site.

5. If the concentration of lead, mercury or PCB leachate in paints is at a level that is considered hazardous, the paint and painted building materials, if removed from the Site, must be disposed of as hazardous waste.
6. Lead, Mercury and PCB containing paints that are in good condition do not pose significant risks to human health, unless the paints are disturbed by operations such as grinding, cutting or sand blasting.
7. Lead, Mercury and PCB based paints that are in poor condition may pose health concerns for building occupants or on-site workers. Lead, Mercury and PCB based paints that are in poor condition should be removed or repaired by an experienced abatement contractor.
8. A management action plan for lead, mercury and PCB containing paints should be developed for the site.
9. The results of a limited inspection of light ballasts can be used to evaluate the presence of PCB ballasts in a building. If the apparently oldest ballasts on a floor of a building do not contain PCBs, then it is likely that none of the ballasts on the floor contain PCBs. If any of the inspected ballasts on a floor of a building contain PCBs, then all ballasts on that floor of the building must either be inspected or be treated as though they contain PCBs. Based on the available information and the observations from the limited inspections, it is possible that PCB-containing fluorescent light ballasts are located within the site buildings. It is recommended that all ballasts within the buildings be inspected upon removal or be treated as though they contain PCBs. The removal and handling of the ballasts will have to be addressed as part of a remedial action plan for the site. This may include further inspection of ballasts prior to demolition if areas of site buildings are determined to be safe and/or the removal and handling of ballasts as part of demolition debris. Electrical equipment was observed on site and some equipment was empty of dielectric fluids and cores. In the event that the electrical equipment present at the Site is to be removed from the property, the dielectric fluids within the equipment (if present) must be tested for PCBs to assess transportation and disposal requirements. A management action plan for PCB containing electrical equipment should be developed for the site.
10. Various unidentified chemicals were present on the Rambler Main Mine Site including quantities of unknown chemicals, product samples and reagents. Chemical storage was observed or suspected within the Mill Building, the Chemical Laboratory, the Hoist Building and the Main Office. Before these buildings are renovated and/or demolished, a qualified contractor should conduct an inventory of the suspect chemicals. A management action plan for on-site chemicals should be developed to include options for the removal, disposal and/or management of the chemicals. The chemicals should be handled, removed and disposed of by a qualified contractor.
11. Extensive water damage and suspect mold growth was observed or suspected within some of the site buildings including the Main Office and the buildings in the Bunkhouse Area.
12. Qualified contractors experienced in the handling and disposal of hazardous building materials should complete any abatement of hazardous materials in accordance with applicable work procedures, guidelines, and/or regulations.

5.0 CLOSURE

This report has been prepared for the sole benefit of the Newfoundland and Labrador Department of Natural Resources. The report may not be used by any other person or entity without the express written consent of Jacques Whitford and the Newfoundland and Labrador Department of Natural Resources.

Any use which a third party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such third parties. JW accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions presented in this report represent the best technical judgement of Jacques Whitford Limited based on the data obtained from the work and on observations made during the site inspection from September 4 to 21, 2007. The conclusions are based on the site conditions encountered by Jacques Whitford Limited at the time the work was performed at the specific testing and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the site reflecting natural, construction and other activities. In addition, analysis has been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Jacques Whitford Limited cannot warrant against undiscovered environmental liabilities.

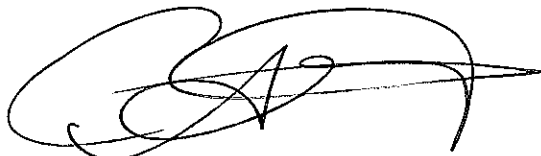
A hazardous materials assessment is a limited sampling of a site. The conclusions given herein are based on information gathered at the specific sample locations and can only be extrapolated to an undefined limited area around these locations. In addition, analysis has been carried out for asbestos-containing materials and lead, mercury and PCBs in paint, and it should not be inferred that other chemical species are not present. A complete inspection of all wall and ceiling spaces for concealed asbestos, UFFI or mold was not carried out; only a limited inspection of accessible spaces was carried out. A complete inspection of the site building for the presence of PCBs was not carried out; only a limited inspection of random fluorescent light ballasts was carried out.

Should any conditions at the site be encountered which differ from those described herein, we request that we be notified immediately in order to assess the additional information and its effects on the above conclusions and recommendations.

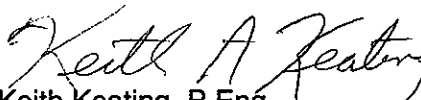
This report was prepared by Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo. and Paula Brennan, M.A.Sc., P.Eng. and reviewed by Keith Keating, P.Eng.

Respectfully submitted,

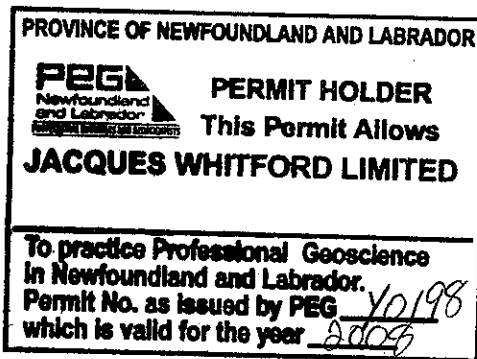
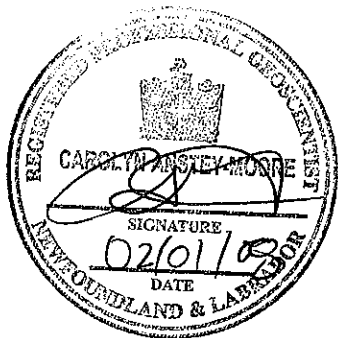
JACQUES WHITFORD LIMITED



Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.
Environmental Geoscientist

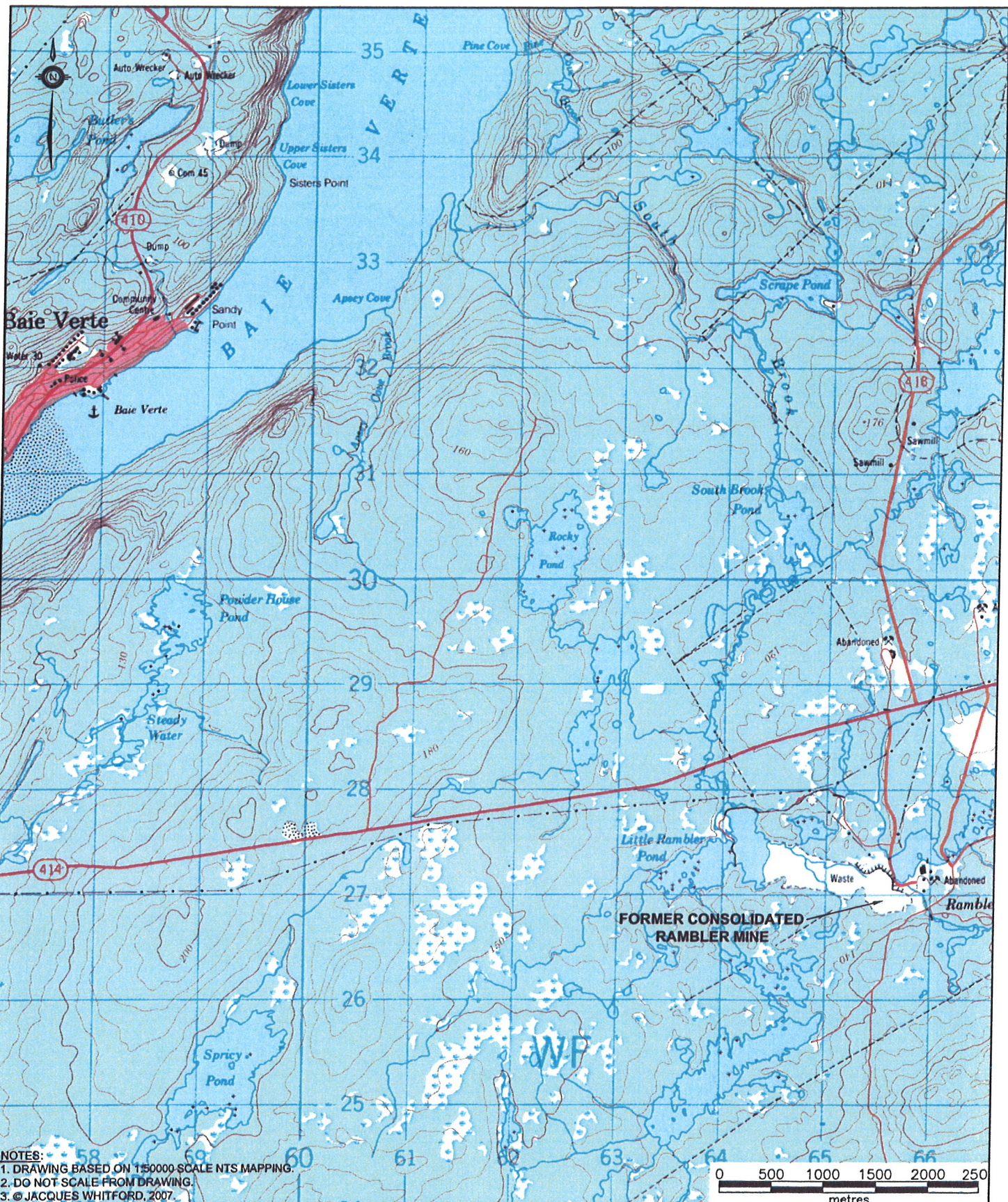


Keith Keating, P.Eng.
Senior Environmental Engineer



APPENDIX 1a

Regional Drawings

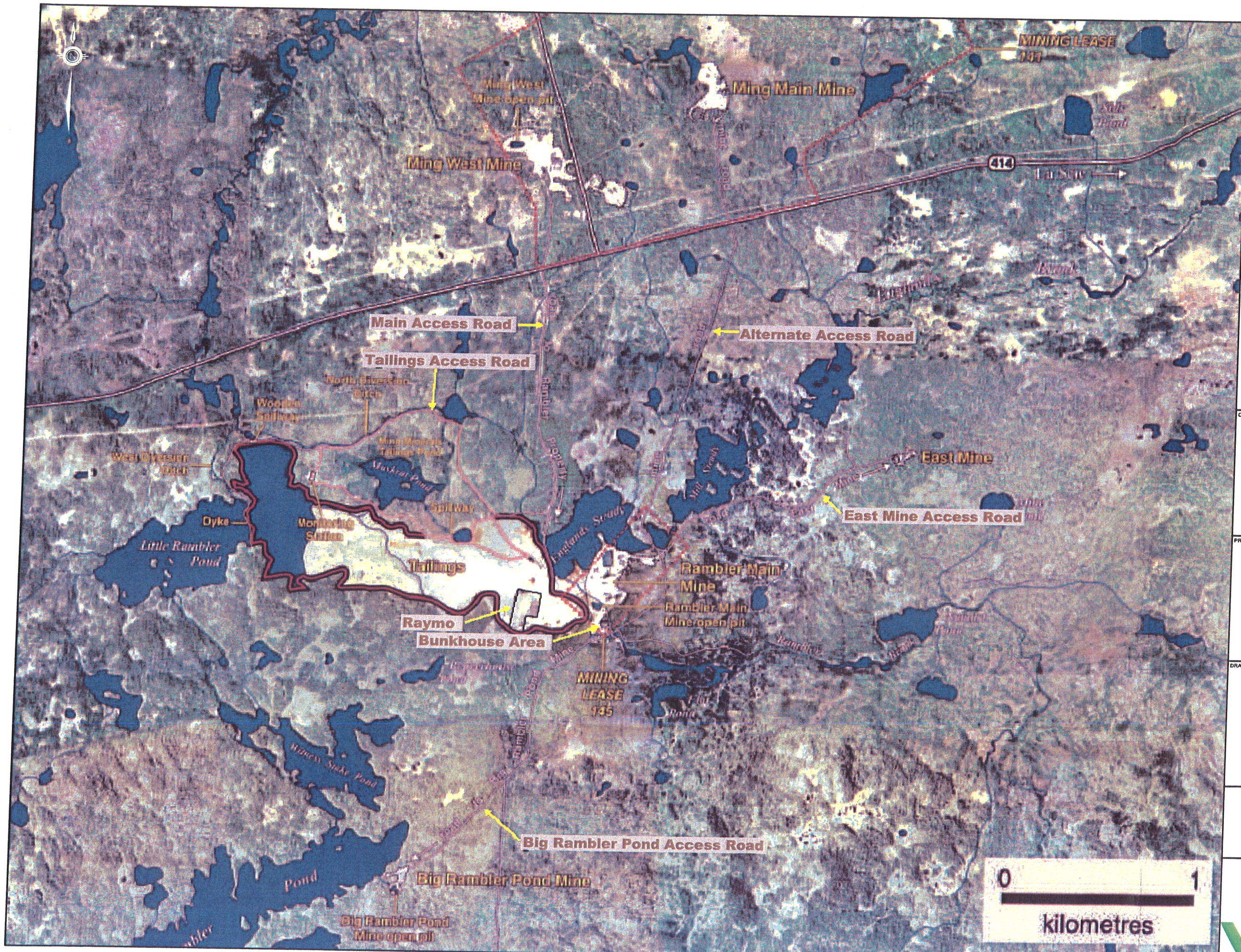


NOTES:
 1. DRAWING BASED ON 1:50000 SCALE NTS MAPPING.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

CLIENT:	NEWFOUNDLAND AND LABRADOR DEPARTMENT OF NATURAL RESOURCES
PROJECT TITLE:	PHASE III ENVIRONMENTAL SITE ASSESSMENT, FORMER CONSOLIDATED RAMBLER MINE, BAIE VERTE, NL
DRAWING TITLE:	REGIONAL PROPERTY LOCATION MAP

SCALE:	1:50000	DATE:	DEC. 13, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No.:	1028976-EE-01		
CAD FILE:	1028976-EE-28.DWG		





LEGEND

- NOTES:**
1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
 3. © JACQUES WHITFORD, 2007.

CLIENT:

NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF NATURAL RESOURCES

PROJECT TITLE:

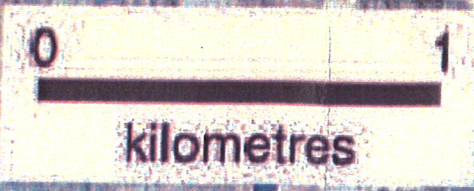
PHASE III ENVIRONMENTAL SITE
ASSESSMENT, FORMER CONSOLIDATED
RAMBLER MINE, BAIE VERTE, NL

DRAWING TITLE:

PROPERTY LOCATION PLAN

Jacques Whitford
CONSULTING ENGINEERS

SCALE:	AS SHOWN	DATE:	DEC. 13, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No.:	1028976-EE-02		
CAD FILE:	1028976-EE-23.DWG		



APPENDIX 1b

Applicability of the Tier I/II RBSL/PSSL Tables and Ecological Receptor
Screening Checklist

APPLICABILITY OF THE TIER I/II RBSL/PSSL TABLES

If the Tier I Risk-Based Screening Level (RBSL) criteria or the Tier II Pathway-Specific Screening Level (PSSL) criteria are to be used, the Site Professional must ensure that the actual site conditions are consistent with the default parameters used to calculate the criteria in the RBSL or PSSL Tables. If not, the site-specific differences must be incorporated by using the Atlantic RBCA model and the development of Site-Specific Target Levels (SSTL).

Table 1 Tier I/II Checklist

Defaults and Mandatory Criteria		Compatible with Defaults?
Issue	Yes or No/ Comment	
Is there surface staining?	YES	NO
Is there free product in soil or water?	No, none identified	NO
Are there odours or explosive conditions in buildings or infrastructure?	NO (for those buildings assessed only)	YES
Is there objectionable taste or odour in potable water supplies?	NO - Non-potable site.	YES
Is any further activity required from the Ecological Screening Document?	YES (see Ecological Screening)	NO
Is there any impacted water known or reasonably suspected to be in bedrock?	Possible	YES
Is the depth to groundwater approximately 3 metres?	Depth to groundwater is approximately 3.0 m in some areas of the site, but does vary for each study area within the site as whole.	YES
Is the impacted soil thickness less than 3 metres?	YES	YES
Does the on-site building have any of the following: - single storey residential building with no basement? - floor slab thickness less than 11.25 cm? - concrete floor with cracks exceeding the default crack fraction? - dirt basement floor? - sump with dirt bottom? - basements where soil is impacted above applicable Tier I RBSL is in contact with foundation walls?	NO	YES
Do the site conditions significantly differ from those of the default parameters?	NO - The site conditions are such that the Tier I Look Up Table criteria are conservative for this site.	YES

If the site conditions are not compatible with the default assumptions, a Tier II or a Tier III risk assessment approach may be required. If more than one type of petroleum product is found on a site, the lowest Look Up Table value should be used.



APPENDIX 1
Atlantic RBCA Version 2

REFERENCE GUIDELINES TIER ONE CHECK LIST

FOR

ECOLOGICAL RECEPTOR SCREENING

IN ATLANTIC CANADA

ATLANTIC PARTNERS IN RBCA IMPLEMENTATION

June 2003

Purpose

This document provides guidance for conducting a TIER I 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 (ERA).

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 judgement determines that additional or different evaluation is required for a particular site.

Introduction

The components of this evaluation are divided into two steps. Step 1 identifies the presence of ecological receptors on or adjacent to the site, within a suggested distance of 150 metres. This distance is subject to professional judgement.

Step 2 determines the potential for the ecological receptors to be exposed to released hydrocarbons. Risks to ecological receptors essentially require the presence of receptors, potential pathways and the 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 Possible
- Other critical or sensitive habitat for wildlife, migratory species Possible

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 on 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? No
- Can LNAPL (Light Non Aqueous Phase Liquids) reach any receptor habitat identified above? No
- Can hydrocarbons reach any receptor habitat identified above via surface runoffs? No

If the site is under a 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 soil, water, or plants? YES
- Have hydrocarbons, associated with the site being investigated, been known to be present in any of the soils, sediments, or surface water of the receptor habitat(s) identified above at concentrations greater than CCME ecologically-based guidelines? Possible

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 provide documentation or rationale for the answers provided.

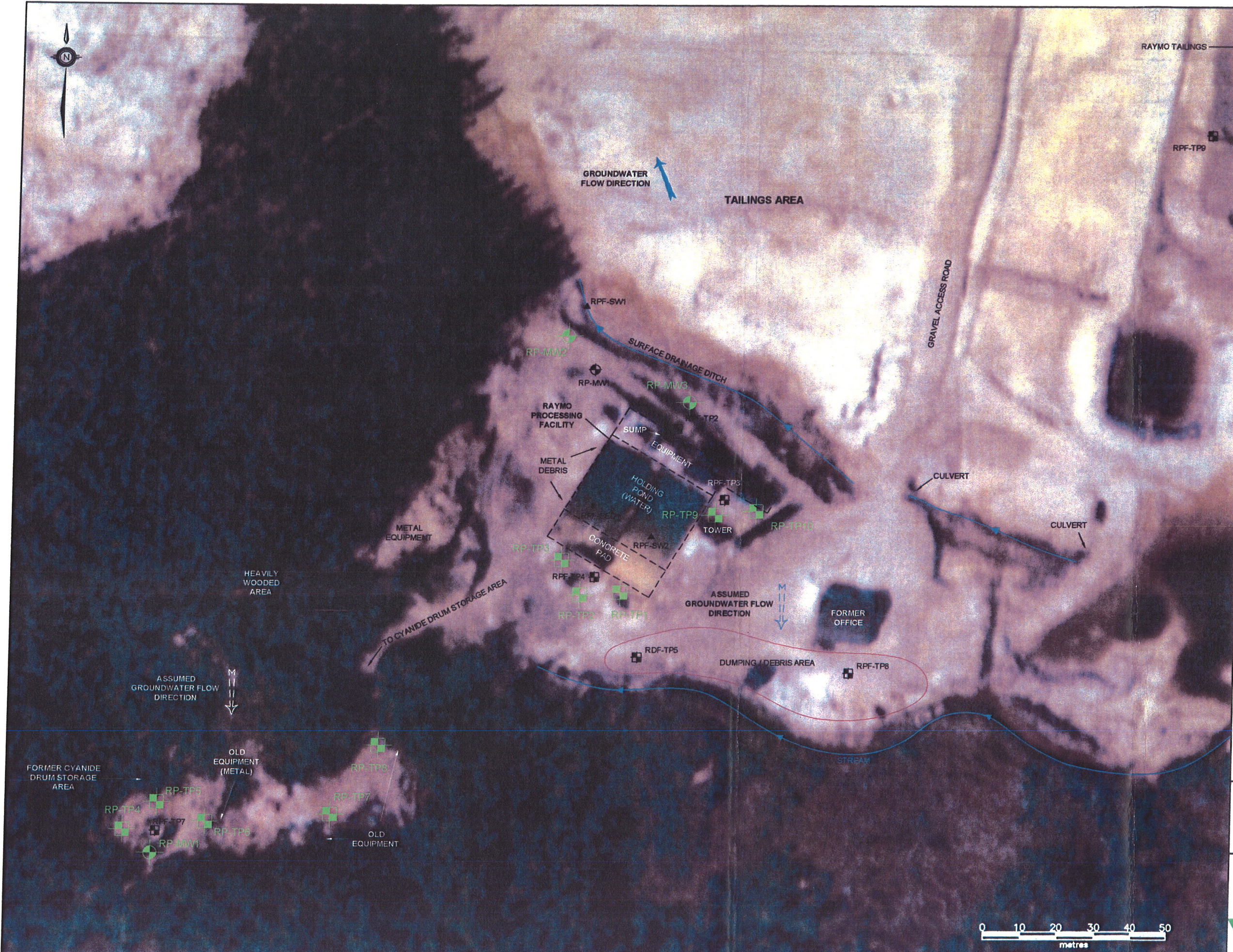
Further assessment of ecological receptors for petroleum hydrocarbons impacts (as well as other chemicals of concern) may be required in portions of the study site area to determine if there are risks to identified ecological receptors for this site. Also, there has been no evaluation to determine if there are rare, threatened or endangered species associated with this site or if sensitive habitats are present for species or migratory species. Further evaluation is recommended.

References;

- 1) ASTM, RBCA Draft Provisional Standard (RBCA II), Appendix 5 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 2a

Site Drawings – Raymo Processing Facility



LEGEND

- TP TEST PIT (CURRENT INVESTIGATION)
- MW MONITOR WELL (CURRENT INVESTIGATION)
- FORMER TEST PIT LOCATION (AMEC, 2007)
- FORMER MONITOR WELL LOCATION (AMEC, 2007)
- SW FORMER SURFACE WATER SAMPLE LOCATION (AMEC, 2007)
- SED FORMER SEDIMENT SAMPLE LOCATION (AMEC, 2007)

NOTES:
 1. DRAWING BASED ON 1999 AERIAL PHOTOGRAPHY.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
 3. © JACQUES WHITFORD, 2007.

CLIENT:

**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:

**PHASE III ENVIRONMENTAL SITE
 ASSESSMENT, FORMER CONSOLIDATED
 RAMBLER MINE, BAIE VERTE, NL**

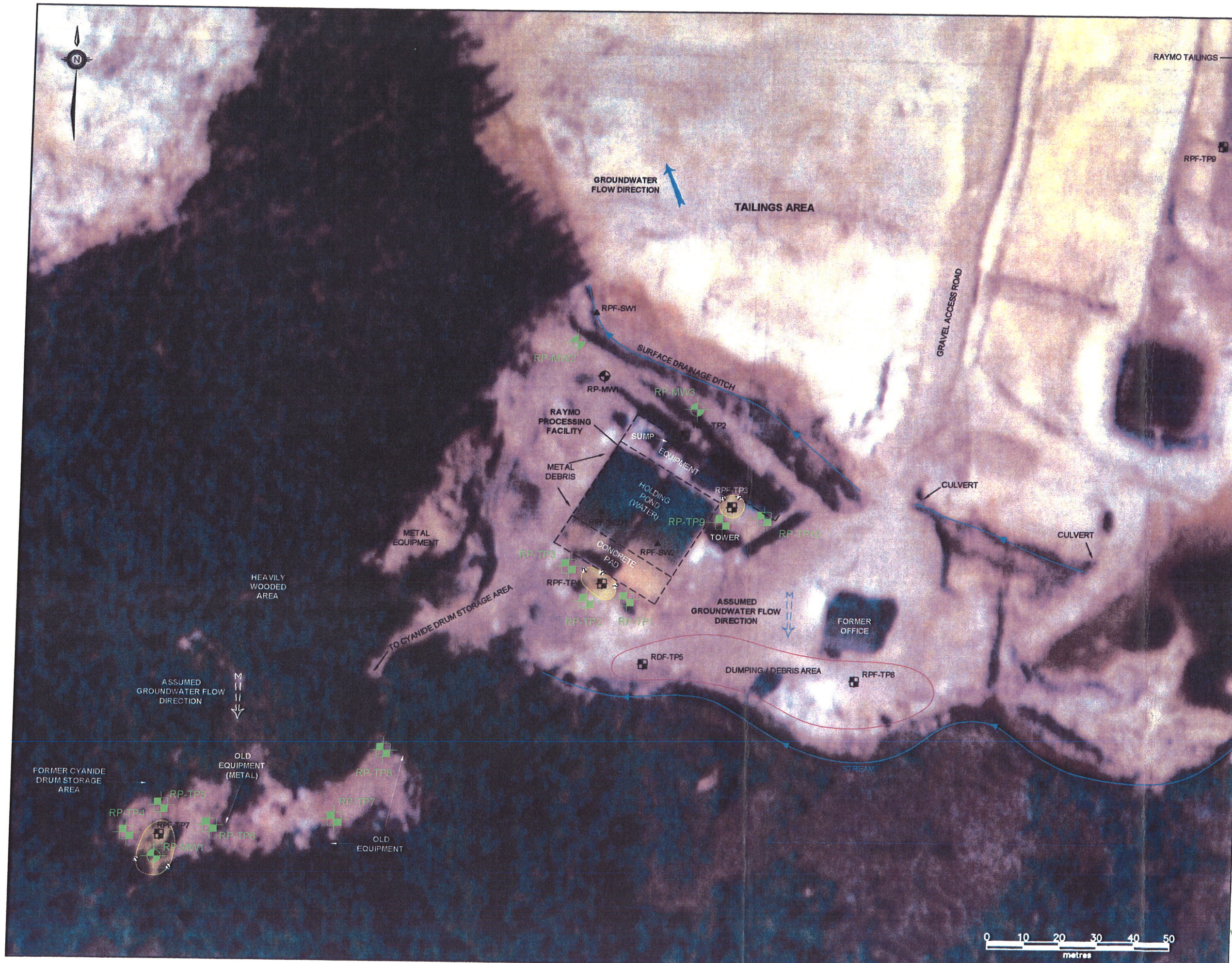
DRAWING TITLE:

**SITE AND PHASE III ESA
 SAMPLE LOCATION PLAN
 RAYMO PROCESSING FACILITY AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE	1:1000	DATE	DEC. 13, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No.	1028976-EE-03		
CAD FILE	1028976-EE-05.DWG		





- TP TEST PIT (CURRENT INVESTIGATION)
- MW MONITOR WELL (CURRENT INVESTIGATION)
- FORMER TEST PIT LOCATION (AMEC, 2007)
- FORMER MONITOR WELL LOCATION (AMEC, 2007)
- SW FORMER SURFACE WATER SAMPLE LOCATION (AMEC, 2007)
- SED FORMER SEDIMENT SAMPLE LOCATION (AMEC, 2007)
- ESTIMATED EXTENT OF AREA WITH CYANIDE IN SOIL > CCME CRITERIA FOR AN INDUSTRIAL SITE (8 mg/kg)

NOTES:
 1. DRAWING BASED ON 1999 AERIAL PHOTOGRAPHY.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
 3. © JACQUES WHITFORD, 2007.

CLIENT
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

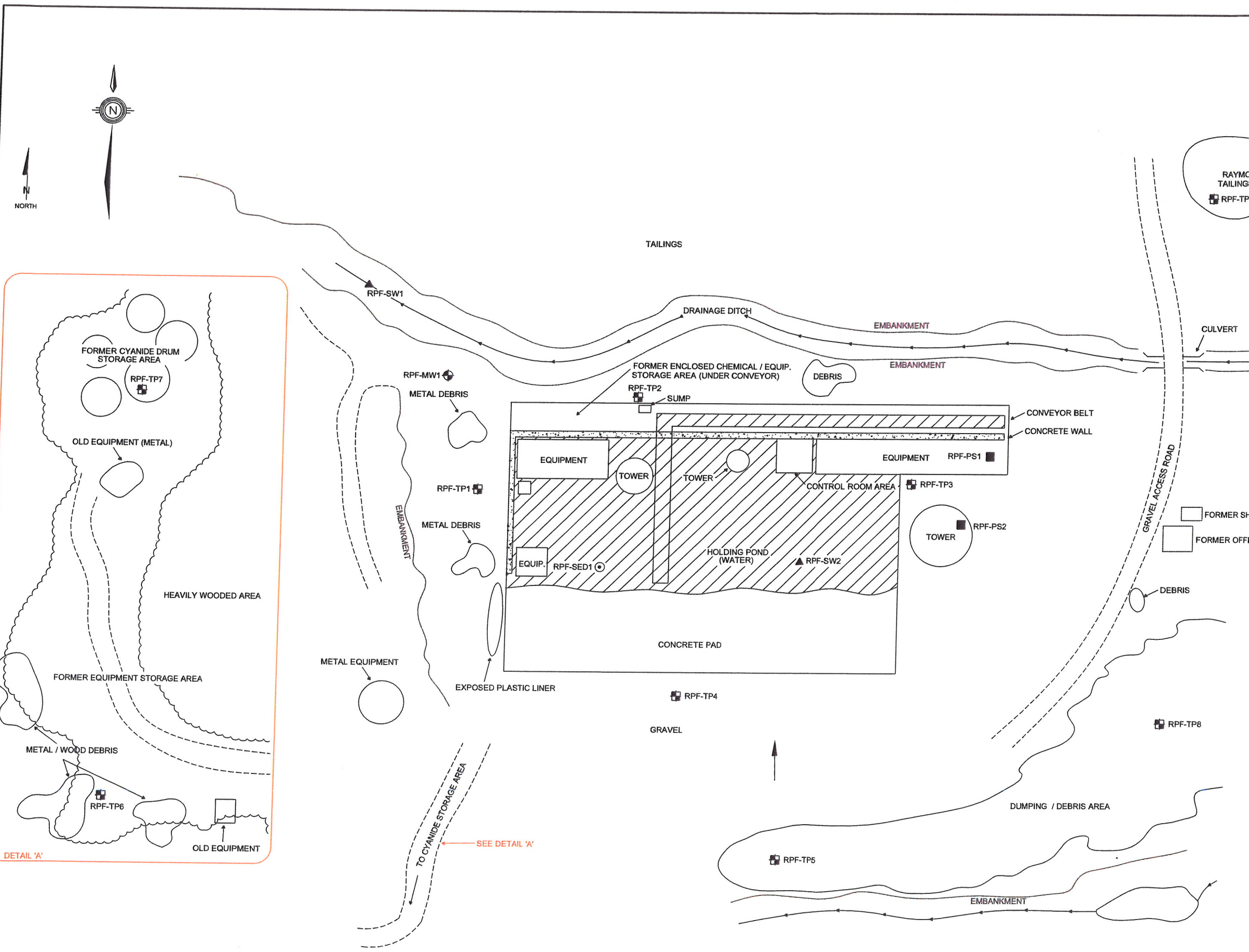
PROJECT TITLE
**PHASE III ENVIRONMENTAL SITE
 ASSESSMENT, FORMER CONSOLIDATED
 RAMBLER MINE, BAIE VERTE, NL**

DRAWING TITLE
**ESTIMATED EXTENT OF
 CYANIDE IMPACTS IN SOIL
 RAYMO PROCESSING FACILITY AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE	1:1000	DATE	DEC. 13, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No:	1028976-EE-04		
CAD FILE:	1028976-EE-27.DWG		





LEGEND

- TREE LINE
- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL LOCATION (AMEC 2006)
- TEST PIT LOCATION (AMEC 2006)
- SEDIMENT SAMPLE LOCATION (AMEC 2006)
- SURFACE WATER SAMPLE LOCATION (AMEC 2006)
- PAINT SAMPLE LOCATION (AMEC 2006)

NOTES:
 1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT & JW FIELD NOTES.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ESA & HAZARDOUS
 MATERIALS ASSESSMENT
 FORMER CONSOLIDATED RAMBLER MINE
 RAYMO PROCESSING FACILITY, BAIE VERTE, NL**

DRAWING TITLE:
**HAZARDOUS MATERIALS ASSESSMENT
 SAMPLE LOCATION PLAN
 RAYMO PROCESSING FACILITY**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	NTS	DATE:	DEC. 12, 2007
DRAWN BY:	S.N.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No.:	1028976-EE-05		
CAD FILE:	1028976-EE-21.DWG		



APPENDIX 2b

Test Pit & Monitor Well Records
& Symbols and Terms – Raymo Processing Facility

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology Describing Common Soil Genesis

<i>Rootmat</i>	-	vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	-	mixture of soil and humus capable of supporting good vegetative growth
<i>Peat</i>	-	fibrous aggregate of visible and invisible fragments of decayed organic matter
<i>Loam</i>	-	silty sand or sand with silt mixed with organics matter
<i>Till</i>	-	unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	-	any materials below the surface identified as placed by humans (excluding buried services)

Terminology Describing Soil Structure

<i>Homogeneous</i>	-	same colour and appearance throughout
<i>Stratified</i>	-	composed of alternating successions of different soil types, e.g., silt and sand
<i>Lensed</i>	-	inclusion of small pockets of different soils
<i>Laminated</i>	-	alternating layers of varying material or colour with the layers less than 6 mm thick
<i>Layer</i>	-	thickness > 75 mm
<i>Seam</i>	-	thickness between 2 mm and 75 mm
<i>Parting</i>	-	thickness < 2 mm

Grain Size and Plasticity

Terminology describing soils on the basis of grain size and plasticity is based on the Unified Soil Classification System (USCS) (ASTM D-2487). The classification excludes particles larger than 76 mm (3 inches). This system provides a group symbol (e.g., SM) and group name (e.g., silty SAND) for identification. Note: terminology describing materials in the absence of laboratory analysis is based on the ASTM D-2488 visual method.

Terminology describing materials outside the USCS (e.g., particles larger than 76 mm, visible organic matter, construction debris) is based on the (visually estimated) proportion of these materials present:

<i>Trace, or occasional</i>	Less than approximately 10%
<i>Some</i>	approximately 10-20%
<i>Frequent</i>	Greater than approximately 20%

Standard Penetration Test 'N-Value'

The performance of the Standard Penetration Test provides an 'N-value'; the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (51 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration is achieved and 'N' values cannot be determined, the number of blows is reported over sampler penetration in millimetres (e.g., 50/75).

Density of Cohesionless Soils

The standard terminology to describe cohesionless soils includes the compactness (formerly "relative density"), as determined by laboratory test or by the Standard Penetration Test 'N- value'.

Density	N-Value	Compactness %
<i>Very Loose</i>	< 4	< 15
<i>Loose</i>	4-10	15-35
<i>Compact</i>	10-30	35-65
<i>Dense</i>	30-50	65-85
<i>Very Dense</i>	> 50	> 85

Consistency of Cohesive Soils

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		N-Value
	ksf	kPa	
<i>Very Soft</i>	< 0.25	< 12.5	< 2
<i>Soft</i>	0.25-0.5	12.5-25	2-4
<i>Firm</i>	0.5-1.0	25-50	4-8
<i>Stiff</i>	1.0-2.0	50-100	8-15
<i>Very Stiff</i>	2.0-4.0	100-200	15-30
<i>Hard</i>	> 4.0	> 200	> 30

ROCK DESCRIPTION

Rock Quality Designation (RQD)

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be applied to NW core; however, it can be used on different core sizes if most of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures.

RQD (%)	Rock Quality
90-100	Excellent - intact, very sound
75-90	Good - moderately jointed, massive, sound
50-75	Fair - fractured, blocky and seamy
25-50	Poor - severely fractured, shattered and very seamy or blocky
0-25	Very poor - very severely fractured, crushed

Total Core Recovery (TCR)

Total core recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

Weathering State

Term	Description
Slight	Weathering limited to the surface of major discontinuities. Typically iron stained.
Moderate	Weathering extends throughout rock mass. Rock is not friable.
High	Weathering extends throughout rock mass. Rock is friable (crumbles naturally or broken between fingers).

Terminology Describing Rock Mass

Spacing (mm)	Bedding, Laminations, Bands	Discontinuity
2000-6000	Very Thick	Very wide
600-2000	Thick	Wide
200-600	Medium	Moderately close
60-200	Thin	Close
20-60	Very Thin	Very close
< 20	Laminated	Extremely close
< 6	Thinly Laminated	

RECORD SYMBOLS AND ABBREVIATIONS

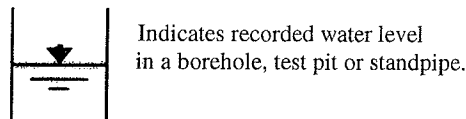
Sample Types

SS	Split spoon sample (obtained by performing the Standard Penetration Test)	WS	Wash sample	ST	Shelby tube or thin wall tube
		BS	Bulk sample	HQ, NQ, BQ, etc.	Rock core samples obtained using standard size diamond drilling bits.
		RC	Rock chip sample		

Laboratory Tests

S	Sieve analysis	H	Hydrometer analysis	A	Atterberg limits
---	----------------	---	---------------------	---	------------------

Water Level Measurement



Strata Plot

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

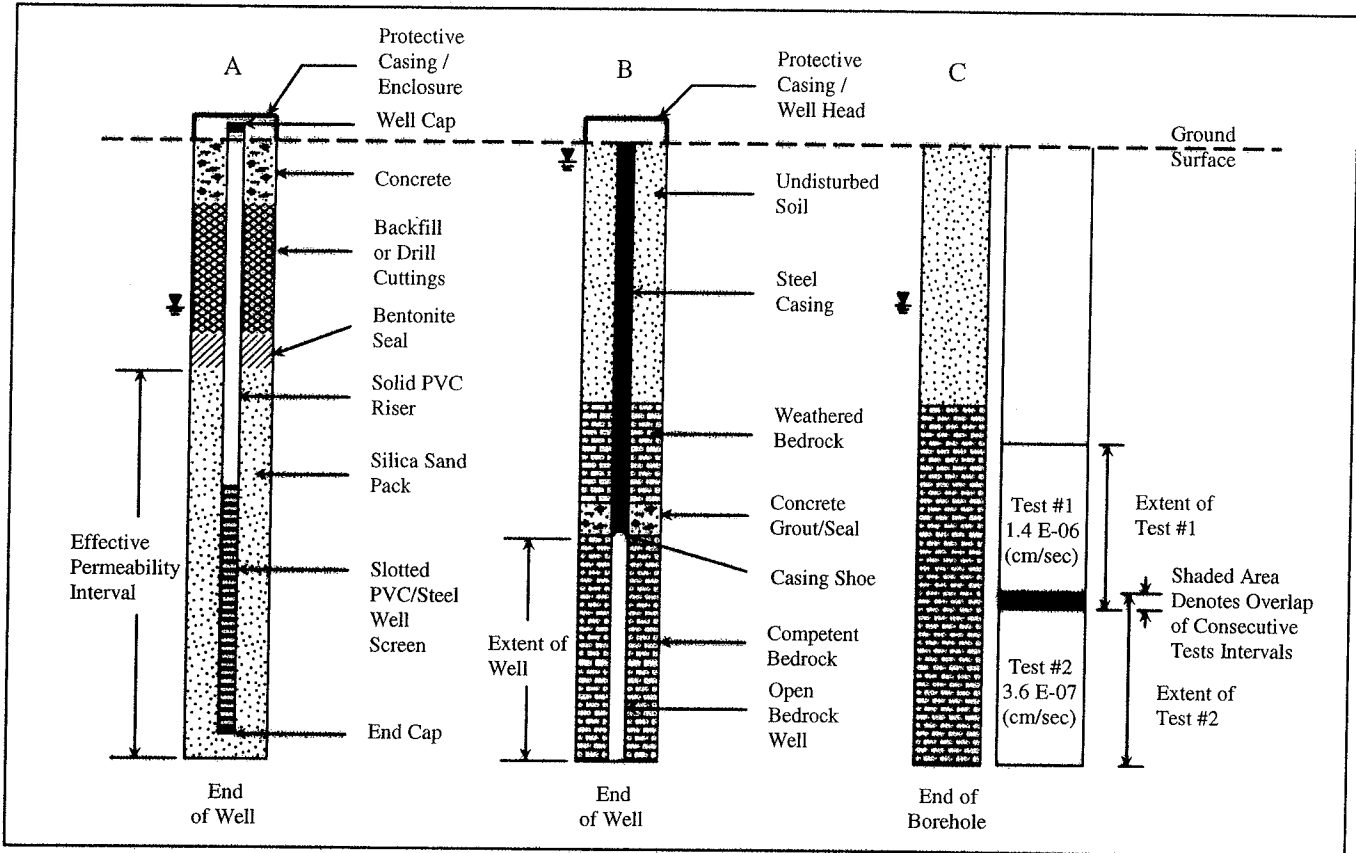
Boulders Cobbles Gravel	Sand	Silt	Clay	Organics	Asphalt	Concrete	Fill	Igneous Bedrock	Meta- morphic Bedrock	Sedi- mentary Bedrock

Solid lines between strata indicate the boundary between different strata. Dashed lines between strata indicate the boundary between strata is inferred.

SYMBOLS AND TERMS USED ON MONITOR WELL, WATER WELL AND ENVIRONMENTAL RECORDS

Well Construction and Permeability Testing

Basic symbols used in typical monitor or water well and piezometer construction are shown below. The well construction symbols or materials shown below may be combined or altered to suit a particular application. The diagram shows: A) a typical piezometer or monitor well in overburden; B) a typical water well in bedrock; C) borehole permeability test results in bedrock.



Apparent Moisture Content

Terminology used to describe apparent moisture content at the time of borehole drilling or test pit excavation.

Symbol	Description
D	Dry – containing little or no moisture
M	Moist – containing some moisture without having 'free' moisture
S	Saturated – 'free' moisture can drain from material

Terminology Describing Contamination

PID	-	Photo Ionization Detector (readings in ppm)
TPH	-	Total Petroleum Hydrocarbon concentration (readings in ppm based on mass)
ppm	-	Parts Per Million (measurement of concentration, mg/kg or mg/L)
nd	-	Not Detected – below limit of quantification (LOQ)

Apparent Hydrocarbon Odour


Terminology used to describe apparent hydrocarbon odour at the time of borehole drilling or test pit excavation.

Value	Description
0	No apparent odour
1	Slight odour
2	Moderate odour
3	Strong odour

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TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP1
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____


DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)						
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES		
0		Loose, brown grey silty SAND with gravel (SM)			BS	1			3.2	-	-	-	-	-		
					BS	2				2.1	-	-	-	-	-	-
1					BS	3				3.8	-	-	-	-	-	-
					BS	4				3.6	-	-	-	-	-	-
2		End of Test Pit Groundwater not encountered. Bedrock encountered at 1.7 m depth.														
3																
4																
5																



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TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP2
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

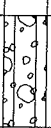
DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)					
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, brown SAND with gravel (SM); some cobbles			BS	1			1.7	-	-	-	-	-	
					BS	2			2.8	-	-	-	-	-	
					BS	3			9.5	-	-	-	-	-	
1		End of Test Pit Groundwater not encountered. Bedrock encountered at ~0.9 m depth.													
2															
3															
4															
5															



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TEST PIT RECORD


CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP3
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE
0		Loose, brown GRAVEL with silt (SP); some cobbles			BS	1			7.6	-	-	-	-	-
		End of Test Pit			BS	2			4.2	-	-	-	-	-
1		Groundwater not encountered. Bedrock encountered at ~0.4 m depth.												
2														
3														
4														
5														



TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP4
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

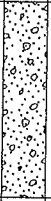
DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Compact, brown SAND with gravel (SP)			BS	1			5.3	-	-	-	-	-
		End of Test Pit			BS	2			5.1	-	-	-	-	-
		Groundwater not encountered.												
		Bedrock encountered at ~0.3 m depth.												



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TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP5
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

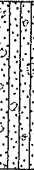
DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE
0		Loose, brown SAND with gravel (SP); with fractured bedrock			BS	1			3.4	-	-	-	-	-
					BS	2			5.2	-	-	-	-	-
1		End of Test Pit Groundwater not encountered. Bedrock encountered at ~0.7 m depth. Note: Full drum of cyanide salt found buried near surface near locations of test pit.												
2														
3														
4														
5														



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TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP6
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____


DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE
0		Loose brown silty SAND with gravel (SM)			BS	1			4.7	-	-	-	-	-
					BS	2			6.5	-	-	-	-	-
1		End of Test Pit Groundwater not encountered. Bedrock encountered at ~0.6 m depth.												
2														
3														
4														
5														



JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP7
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____


DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose brown grey SAND with gravel (SM); with fractured bedrock			BS	1			5.8	-	-	-	-	-
					BS	2			3.2	-	-	-	-	-
		End of Test Pit												
1		Groundwater not encountered. Bedrock encountered at ~0.6 m depth.												
2														
3														
4														
5														



JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP8
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)					
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	
0		Loose, brown grey SAND with silt and gravel (SP-SM); some cobbles			BS	1			1.4	-	-	-	-	-	
							BS	2			0.0	-	-	-	-
1							BS	3			3.8	-	-	-	-
							BS	4			2.7	nd	nd	nd	nd
		End of Test Pit													
		Groundwater not encountered.													
2		Bedrock encountered at ~ 1.4 m depth.													
3															
4															
5															



JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment TEST PIT No. RPJW07-TP9
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)					
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	
0		Loose, brown grey SAND with silt and gravel (SP-SM); ore rock throughout			BS	1			1.5	-	-	-	-	-	
							BS	2			2.7	-	-	-	-
1							BS	3			1.3	-	-	-	-
							BS	4			1.8	-	-	-	-
2		End of Test Pit Groundwater not encountered. Bedrock encountered at ~ 1.8 m depth.													
3															
4															
5															




JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Waste Materials Assessment
 LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A

TEST PIT No. RPJW07-TP10
 PROJECT No. 1028976
 DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, brown grey SAND with silt and gravel (SP-SM); ore rock throughout												
				BS	1				1.6	-	-	-	-	-
				BS	2			2.9	-	-	-	-	-	
1		End of Test Pit Groundwater not encountered. Bedrock encountered at ~0.8 m depth.												
2														
3														
4														
5														



CLIENT Newfoundland and Labrador Department of Natural Resources

PAGE 1 of 1

PROJECT Phase III ESA & Hazardous Waste Materials Assessment

PROJECT No. 1028976

LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility

DRILLING METHOD Dia

DATES (mm-dd-yy): BORING 9-14-07

WATER LEVEL 2.99 m 9-20-07

SIZE HQ

DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Compact, brown sandy loam: TOPSOIL					mm						CAST IRON WELL HEAD
					SS	1		10	-	D	2.4	-	BACKFILL
													BENTONITE
1		Very severely fractured BEDROCK: felsic volcanics			RC	2			-	-	-	-	50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
					RC	3	450		-	-	-	-	
2					RC	4	900		-	-	-	-	
3													
4		End of Borehole											END CAP
5													



CLIENT Newfoundland and Labrador Department of Natural Resources

PROJECT No. 1028976

PROJECT Phase III ESA & Hazardous Waste Materials Assessment

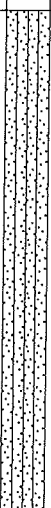
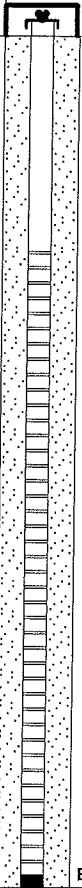
DRILLING METHOD Auger

LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility

SIZE HS

DATES (mm-dd-yy): BORING 9-15-07 WATER LEVEL 1.83 m 9-14-07

DATUM Assumed

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	99.28	Compact, brown silty SAND (SM)		▼			mm						 <p>CAST IRON WELL HEAD</p> <p>50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK</p> <p>END CAP</p>
	SS				1		16	-	D	3.2	-		
1					SS	2		9	-	D	4.6	-	
					SS	3	50	4	-	W	4.4	-	
2	97.5	Compact, brown silty SAND (SM); trace organics			SS	4	200	52	-	W	6.7	-	
	96.8	Greenish-grey SILT (ML); trace organics											
3	96.2	End of Borehole											
4													
5													



CLIENT Newfoundland and Labrador Department of Natural Resources

PROJECT Phase III ESA & Hazardous Waste Materials Assessment

LOCATION Former Consolidated Rambler Mine Site - Raymo Processing Facility

DATES (mm-dd-yy): BORING 9-15-07 WATER LEVEL 1.8 m 9-14-07

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Compact, greyish brown SILT (ML) with sand and gravel					mm						CAST IRON WELL HEAD
					SS	1	300	13	-	D	7.2	-	
1		Compact, brownish-grey fine to medium SAND (SP)											BENTONITE
					SS	2	0	6	-	-	-	-	
2		Dense, grey-brown SILT (ML) with gravel											50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
					SS	3	200	8	-	-	4.6	-	
3													
					SS	4	350	41	-	D-M	6.3	-	
4													
					SS	5	-	-	-	-	-	-	
5													
					SS	6	-	-	-	-	-	-	
6		End of Borehole											END CAP
					SS	7	-	-	-	-	-	-	
7													
					SS	8	-	-	-	-	-	-	
8													



APPENDIX 2c

Laboratory Analytical Results Summary Tables – Raymo Processing Facility
(Current Investigation & AMEC, 2007)

Table 2.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976

Parameters	Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10 (Gas Range)	C10-C21 (Fuel Range)	C21-C32 (Lube Range)	Modified TPH - Tier I ³	Resemblance
RDL	0.03	0.03	0.03	0.05	3	15	15	20	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Criteria ¹	1.8	160	430	200	na	na	na	7,400	
Criteria ²	1.8	160	430	200	na	na	na	10,000	
RP-JW07-TP8-BS3	nd	nd	nd	nd	nd	nd	nd	nd	-

Notes:

- 1 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for commercial site with non-potable groundwater, coarse-grained soil and fuel oil impacts
 - 2 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for a commercial site with non-potable groundwater, coarse-grained soil and lube oil impacts
 - 3 = Modified TPH - Tier I does not include BTEX
- RDL = Reportable detection limit
nd = Not detected above standard RDL
na = No applicable criteria

**Table 2.2 Results of Laboratory Analysis of VOCs in Soil - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976**

Parameters	RDL	Units	Criteria ¹	RP-JW07- MW2-SS3	RP-JW07- MW3-SS4
Chlorobenzenes					
1,2-Dichlorobenzene	30	ug/kg	10,000	nd	nd
1,3-Dichlorobenzene	30	ug/kg	10,000	nd	nd
1,4-Dichlorobenzene	30	ug/kg	10,000	nd	nd
Chlorobenzene	30	ug/kg	10,000	nd	nd
Volatiles					
1,1,1-Trichloroethane	30	ug/kg	50,000	nd	nd
1,1,2,2-Tetrachloroethane	30	ug/kg	50,000	nd	nd
1,1,2-Trichloroethane	30	ug/kg	50,000	nd	nd
1,1-Dichloroethane	30	ug/kg	50,000	nd	nd
1,1-Dichloroethylene	30	ug/kg	na	nd	nd
1,2-Dichloroethane	30	ug/kg	50,000	nd	nd
1,2-Dichloropropane	30	ug/kg	50,000	nd	nd
Benzene	30	ug/kg	30	nd	nd
Bromodichloromethane	30	ug/kg	na	nd	nd
Bromoform	30	ug/kg	na	nd	nd
Bromomethane	200	ug/kg	na	nd	nd
Carbon Tetrachloride	30	ug/kg	50,000	nd	nd
Chloroethane	200	ug/kg	na	nd	nd
Chloroform	30	ug/kg	50,000	nd	nd
Chloromethane	30	ug/kg	na	nd	nd
cis-1,2-Dichloroethylene	30	ug/kg	na	nd	nd
cis-1,3-Dichloropropene	30	ug/kg	na	nd	nd
Dibromochloromethane	50	ug/kg	na	nd	nd
Ethylbenzene	30	ug/kg	82	nd	nd
Ethylene Dibromide	30	ug/kg	na	nd	nd
Methylene Chloride(Dichloromethane)	40	ug/kg	50,000	nd	nd
o-Xylene	30	ug/kg	11,000	nd	nd
p+m-Xylene	30	ug/kg	11,000	nd	nd
Styrene	30	ug/kg	50,000	nd	nd
Tetrachloroethylene	30	ug/kg	600	nd	nd
Toluene	30	ug/kg	370	nd	nd
trans-1,2-Dichloroethylene	30	ug/kg	na	nd	nd
trans-1,3-Dichloropropene	30	ug/kg	na	nd	nd
Trichloroethylene	30	ug/kg	10	nd	nd
Trichlorofluoromethane	30	ug/kg	na	nd	nd
Vinyl Chloride	30	ug/kg	na	nd	nd

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site

RDL = Reportable Detection Limit

nd = Not detected above standard RDL

na = No applicable criteria

**Table 2.3 Results of Laboratory Analysis of PCBs in Soil - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976**

Parameter	Polychlorinated Biphenyls (PCBs)
RDL	0.05
Units	mg/kg
Criteria ¹	33
RP-JW07-TP6-BS1	nd
RP-JW07-TP7-BS1	nd
RP-JW07-TP8-BS3	0.14

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site

RDL = Reportable detection limit

nd = Not detected above standard RDL

**Table 2.4 Results of Laboratory Analysis of Cyanide in Soil - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976**

Parameter	Total Cyanide
RDL	0.5
Units	mg/kg
Criteria ¹	8
RP-JW07-TP1-BS1	2.3
RP-JW07-TP2-BS1	7.1
RP-JW07-TP3-BS2	4.1
RP-JW07-TP4-BS1	nd
RP-JW07-TP5-BS1	0.8
RP-JW07-TP6-BS1	nd
RP-JW07-TP7-BS1	nd
RP-JW07-TP9-BS4	nd
RP-JW07-TP10-BS1	2.1
RP-JW07-MW1-SS1	22

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site (free cyanide)

RDL = Reportable detection limit

nd = Not detected above standard RDL

Shaded = Value exceeds applicable criteria

**Table 2.5 Results of Laboratory Analysis of VOCs in Groundwater - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976**

Parameters	RDL	Units	Criteria ¹	RP-JW07- MW2	RP-JW07- MW3	RPF MW1
Chlorobenzenes						
1,2-Dichlorobenzene	0.5	ug/L	7,600	nd	nd	nd
1,3-Dichlorobenzene	1	ug/L	7,600	nd	nd	nd
1,4-Dichlorobenzene	1	ug/L	7,600	nd	nd	nd
Chlorobenzene	1	ug/L	430	nd	nd	nd
Volatiles						
1,1,1-Trichloroethane	1	ug/L	200	nd	nd	nd
1,1,2,2-Tetrachloroethane	1	ug/L	22	nd	nd	nd
1,1,2-Trichloroethane	1	ug/L	16,000	nd	nd	nd
1,1-Dichloroethane	2	ug/L	9,000	nd	nd	nd
1,1-Dichloroethylene	2	ug/L	0.66	nd	nd	nd
1,2-Dichloroethane	1	ug/L	17	nd	nd	nd
1,2-Dichloropropane	1	ug/L	9.3	nd	nd	nd
Benzene	1	ug/L	1,900	nd	2	nd
Bromodichloromethane	1	ug/L	50,000	nd	nd	nd
Bromoform	1	ug/L	840	nd	nd	nd
Bromomethane	8	ug/L	3.7	nd	nd	nd
Carbon Tetrachloride	1	ug/L	17	nd	nd	nd
Chloroethane	8	ug/L	na	nd	nd	nd
Chloroform	1	ug/L	430	nd	nd	nd
Chloromethane	8	ug/L	na	nd	nd	nd
cis-1,2-Dichloroethylene	2	ug/L	70	nd	nd	nd
cis-1,3-Dichloropropene	2	ug/L	3.8	nd	nd	nd
Dibromochloromethane	1	ug/L	50,000	nd	nd	nd
Ethylbenzene	1	ug/L	28,000	1	3	nd
Ethylene Dibromide	1	ug/L	3.3	nd	nd	nd
Methylene Chloride(Dichloromethane)	3	ug/L	na	nd	nd	nd
o-Xylene	1	ug/L	5,600	3	5	nd
p+m-Xylene	2	ug/L	5,600	5	12	nd
Styrene	1	ug/L	na	nd	nd	nd
Tetrachloroethylene	1	ug/L	5	nd	nd	nd
Toluene	1	ug/L	5,900	6	13	nd
trans-1,2-Dichloroethylene	2	ug/L	100	nd	nd	nd
trans-1,3-Dichloropropene	1	ug/L	3.8	nd	nd	nd
Trichloroethylene	1	ug/L	50	nd	nd	nd
Trichlorofluoromethane	8	ug/L	na	nd	nd	nd
Vinyl Chloride	1	ug/L	0.5	nd	nd	nd

Notes:

1 = Ontario Ministry of the Environment (MOE) Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act for a full depth generic site with non-potable groundwater (Table 3).

RDL = Reportable detection limit

nd = Not detected above standard RDL

na = No applicable criteria

**Table 2.6 Results of Laboratory Analysis of Cyanide in Groundwater - Raymo Processing Facility
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Raymo Processing Facility
Baie Verte, NL
JW Project No. 1028976**

Parameter	Cyanide
RDL	0.002
Units	mg/L
Criteria¹	0.052
RP-JW07-MW1	nd

Notes:

1 = Ontario Ministry of the Environment (MOE) Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act for a full depth generic site with non-potable groundwater (Table 3).

RDL = Reportable detection limit

nd = Not detected above standard RDL

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	137.60
S2006-10988	RPF-PS2	Tower	Metal	Blue on Red	5	92.2

Notes:

MDL: Method detection limit

<X: Below MDL

and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg

and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 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 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 OCMF CERC 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 cells indicate that PCB concentration is above the CCME-CEQC for a commercial property (50 mg/kg)

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

AVERAGE SAMPLING DEPTH (m)	LAB ID	FIELD ID	DATE (D/M/Y)	DATA						GUIDELINES							
				3.1 - 3.5 S2006-10581 RPF-TP1-SS2	1.1 - 2.0 S2006-10585 RPF-TP5-SS3	0 - 0.9 S2006-10586 RPF-TP6-SS1	0 - 0.9 S2006-10593 DUP 1	1.0 - 2.0 S2006-10588 RPF-TP8-SS3	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹							
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(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	<0.01	<0.01	<0.01	0.03	1.8	1.8	1.8	1.8	1.8	1.8
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.37	160	160	160	160	160	160
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.082	430	430	430	430	430	430
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	11	200	200	200	200	200	200
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-
TPH (>C10-C21)	10	<10	<10 (<10)	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-
TPH (>C21-C32)	50	<50	<50 (<50)	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-	-
Modified TPH (C6-C32)	70	<70	<70	<70	<70	<70	<70	<70	<70	<70	-	450	7400	450	7400	450	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 2-9: PCBs in Soil - Raymo Processing Facility

AVERAGE SAMPLING DEPTH (m)		DATA		GUIDELINES
LAB ID		3.1 - 3.5	0 - 0.9	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
FIELD ID		S2006-10582 RPF-TP2-SS4	S2006-10586 RPF-TP6-SS1 06-Sep-06	
DATE (D/M/Y)		06-Sep-06		
PARAMETERS	MDL (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 2-10: Cyanide in Soil - Raymo Processing Facility

AVERAGE SAMPLING DEPTH (m)		DATA				GUIDELINES
LAB ID	1.0 -2.0	3.1 - 3.5	0 - 1.0	0 - 0.5		
FIELD ID	S2006-10581	S2006-10582	S2006-10583	S2006-10584		
DATE (D/M/Y)	RPF-TP1-SS2	RPF-TP2-SS4	RPF-TP3-SS1	RPF-TP4-SS1		
PARAMETERS	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06		
Cyanide	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		
	<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

AVERAGE SAMPLING DEPTH (m)	DATA						GUIDELINES
	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 SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
FIELD ID	RPF-TP5-SS3	RPF-TP6-SS1	RPF-TP7-SS1	RPF-TP8-SS3	RPF-TP9-SS1		
DATE (D/M/Y)	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06	06-Sep-06		
PARAMETERS	MDL (mg/kg)						
Cyanide	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 2-13: BTEX/TPH in Groundwater - Raymo Processing Facility

LAB ID FIELD ID DATE (D/M/Y)	DATA			GUIDELINES	
	Lab Blank	S2006-10867 RPF-MW1 14-Sep-06	(µg/L)	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 2-15: Cyanide in Groundwater - Raymo Processing Facility

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

APPENDIX 2d

Maxxam Analytics Inc. Analytical Reports – Raymo Processing Facility
(Current Investigation)

Maxxam Job #: A799260
Report Date: 2007/09/19

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		U62940	U62940	U63001		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP11-BS1	RM-JW07-TP11-BS1 Lab-Dup	RP-JW07-TP8-BS3	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/kg	ND	ND	ND	0.03	1360693
Toluene	mg/kg	ND	ND	ND	0.03	1360693
Ethylbenzene	mg/kg	ND	ND	ND	0.03	1360693
Xylene (Total)	mg/kg	ND	ND	ND	0.05	1360693
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	3	1360693
>C10-C21 Hydrocarbons	mg/kg	370		ND	15	1362106
>C21-<C32 Hydrocarbons	mg/kg	6700		ND	15	1362106
Modified TPH (Tier1)	mg/kg	7100		ND	20	1358549
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	89		112		1362106
Isobutylbenzene - Volatile	%	84	88	97		1360693
n-Dotriacontane - Extractable	%	5.1 (1)		98		1362106

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Lube oil fraction. TEH surrogate(s) not within acceptance limits due to sample dilution / product interference.

Maxxam Job #: A799260
Report Date: 2007/09/19

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		U62742	U62742	U62914		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP1-BS2	RM-JW07-TP1-BS2 Lab-Dup	RM-JW07-TP2-BS1	RDL	QC Batch

PCBs						
Total PCB	ug/g	0.11	0.14	ND	0.05	1360977
Surrogate Recovery (%)						
Decachlorobiphenyl	%	126 (1)	126	107		1360977
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Aroclor 1260.						

Maxxam ID		U62915	U62961	U62972		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP3-BS4	RP-JW07-TP6-BS1	RP-JW07-TP7-BS1	RDL	QC Batch

PCBs						
Total PCB	ug/g	ND	ND	ND	0.05	1360977
Surrogate Recovery (%)						
Decachlorobiphenyl	%	107	100	100		1360977
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam Job #: A799260
Report Date: 2007/09/19

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		U63001		
Sampling Date		2007/09/07		
COC Number		12116		
Registration #				
	Units	RP-JW07-TP8-BS3	RDL	QC Batch

PCBs				
Total PCB	ug/g	0.14	0.05	1360977
Surrogate Recovery (%)				
Decachlorobiphenyl	%	101 (1)		1360977
RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Aroclor 1254.				

Maxxam Job #: A799260
Report Date: 2007/09/19

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: A7A3137
Report Date: 2007/10/01

Jacques Whitford Limited
Client Project #: 1028976/Z9100/PHASE3 ESA
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		U80012	U80013		
Sampling Date		2007/09/19	2007/09/19		
COC Number		12151	12151		
Registration #					
	Units	RPJW07-MW2-SS3	RPJW07-MW3-SS4	RDL	QC Batch

CHLOROBENZENES					
1,2-Dichlorobenzene	ug/kg	ND	ND	30	1367745
1,3-Dichlorobenzene	ug/kg	ND	ND	30	1367745
1,4-Dichlorobenzene	ug/kg	ND	ND	30	1367745
Chlorobenzene	ug/kg	ND	ND	30	1367745
VOLATILES					
1,1,1-Trichloroethane	ug/kg	ND	ND	30	1367745
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	30	1367745
1,1,2-Trichloroethane	ug/kg	ND	ND	30	1367745
1,1-Dichloroethane	ug/kg	ND	ND	30	1367745
1,1-Dichloroethylene	ug/kg	ND	ND	30	1367745
1,2-Dichloroethane	ug/kg	ND	ND	30	1367745
1,2-Dichloropropane	ug/kg	ND	ND	30	1367745
Benzene	ug/kg	ND	ND	30	1367745
Bromodichloromethane	ug/kg	ND	ND	30	1367745
Bromoform	ug/kg	ND	ND	30	1367745
Bromomethane	ug/kg	ND	ND	200	1367745
Carbon Tetrachloride	ug/kg	ND	ND	30	1367745
Chloroethane	ug/kg	ND	ND	200	1367745
Chloroform	ug/kg	ND	ND	30	1367745
Chloromethane	ug/kg	ND	ND	30	1367745
cis-1,2-Dichloroethylene	ug/kg	ND	ND	30	1367745
cis-1,3-Dichloropropene	ug/kg	ND	ND	30	1367745
Dibromochloromethane	ug/kg	ND	ND	30	1367745
Ethylbenzene	ug/kg	ND	ND	30	1367745
Ethylene Dibromide	ug/kg	ND	ND	30	1367745
Methylene Chloride(Dichloromethane)	ug/kg	ND	ND	40	1367745
o-Xylene	ug/kg	ND	ND	30	1367745
p+m-Xylene	ug/kg	ND	ND	30	1367745
Styrene	ug/kg	ND	ND	30	1367745
Tetrachloroethylene	ug/kg	ND	ND	30	1367745

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7A3137
Report Date: 2007/10/01

Jacques Whitford Limited
Client Project #: 1028976/Z9100/PHASE3 ESA
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

VOLATILE ORGANICS BY GC/MS (SOIL)

Maxxam ID		U80012	U80013		
Sampling Date		2007/09/19	2007/09/19		
COC Number		12151	12151		
Registration #					
	Units	RPJW07-MW2-SS3	RPJW07-MW3-SS4	RDL	QC Batch

Toluene	ug/kg	ND	ND	30	1367745
trans-1,2-Dichloroethylene	ug/kg	ND	ND	30	1367745
trans-1,3-Dichloropropene	ug/kg	ND	ND	30	1367745
Trichloroethylene	ug/kg	ND	ND	30	1367745
Trichlorofluoromethane (FREON 11)	ug/kg	ND	ND	30	1367745
Vinyl Chloride	ug/kg	ND	ND	30	1367745
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	113	120		1367745
D4-1,2-Dichloroethane	%	113	118		1367745
D8-Toluene	%	109	115		1367745

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7A3137
Report Date: 2007/10/01

Jacques Whitford Limited
Client Project #: 1028976/Z9100/PHASE3 ESA
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

VOLATILE ORGANICS BY GC/MS (SOIL)

Volatile Organic Compounds in Soil: Elevated Methylene Chloride (Dichloromethane) RDL due to detected level in the method blank.

Results relate only to the items tested.

Maxxam Job #: A735438
Report Date: 2007/09/28

Maxxam Analytics
Client Project #: A7A3137
Project name:
Sampler Initials:

CONVENTIONAL PARAMETERS (SOIL)

Maxxam ID		D04909		
Sampling Date		2007/09/19		
	Units	U80011-01R\RPJW07-MW1-SS1	RDL	QC Batch
% Moisture	%	21	N/A	N/A
CONVENTIONALS				
Total Cyanide (CN)	mg/kg	22	3	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam ID		D04910	D04911		
Sampling Date		2007/09/19	2007/09/19		
	Units	U80016-01R\RMJW07-MW5-SS1	U80017-01R\RMJW07-MW5-SS3	RDL	QC Batch
% Moisture	%	15	20	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	8.9	<0.5	0.5	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		D04912	D04913		
Sampling Date		2007/09/19	2007/09/19		
	Units	U80018-01R\RMJW07-MW7-SS1	U80019-01R\DUPLICATE#3	RDL	QC Batch
% Moisture	%	5	12	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	1.3	<0.5	0.5	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A735438
Report Date: 2007/09/28

Maxxam Analytics
Client Project #: A7A3137
Project name:
Sampler Initials:

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD

All results are calculated on a dry weight basis except where not applicable.

CONVENTIONAL PARAMETERS (SOIL)

Please note that the results have not been corrected for QC recoveries. Please note that the results have been corrected for the blank. Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.

This report supersedes all previous reports with the same Maxxam job number

Maxxam Job #: A734197
Report Date: 2007/09/19

Maxxam Analytics
Client Project #: A799260
Project name:
Sampler Initials:

CONVENTIONAL PARAMETERS(SOIL)

MaxxamID		C98747	C98748		
SamplingDate		2007/09/07	2007/09/07		
	Units	J62920-02R/RM-JW07-TP6-BS4	J62935-01R/RM-JW07-TP8-BS1	RDL	QC Batch

% Moisture	%	18	16	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	17	21	5	451895

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

MaxxamID		C98749	C98750		
SamplingDate		2007/09/07	2007/09/07		
	Units	J62942-01R/RP-JW07-TP1-BS1	J62943-01R/RP-JW07-TP2-BS1	RDL	QC Batch

% Moisture	%	9	15	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	2.3	7.1	0.5	451895

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

MaxxamID		C98751	C98752		
SamplingDate		2007/09/07	2007/09/07		
	Units	J62944-01R/RP-JW07-TP3-BS2	J62945-01R/RP-JW07-TP4-BS1	RDL	QC Batch

% Moisture	%	11	23	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	4.1	<0.5	0.5	451895

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

MaxxamID		C98753	C98754		
SamplingDate		2007/09/07	2007/09/07		
	Units	J62946-01R/RP-JW07-TP5-BS1	J62961-02R/RP-JW07-TP6-BS1	RDL	QC Batch

% Moisture	%	9	19	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	0.8	<0.5	0.5	451895

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A734197
Report Date: 2007/09/19

Maxxam Analytics
Client Project #: A799260
Project name:
Sampler Initials:

CONVENTIONALPARAMETERS(SOIL)

MaxxamID		C98755	C98756		
SamplingDate		2007/09/07	2007/09/07		
	Units	U62972-02R/RP-JW07-TP7-BS1	U63027-01R/RP-JW07-TP9-BS4	RDL	QC Batch
% Moisture	%	10	14	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	<0.5	<0.5	0.5	452116
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

MaxxamID		C98757			
SamplingDate		2007/09/07			
	Units	U63028-01R/RP-JW07-TP10-BS1	RDL	QC Batch	
% Moisture	%	16	N/A	N/A	
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	2.4	0.5	452116	
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A734197
Report Date: 2007/09/19

Maxxam Analytics
Client Project #: A799260
Project name:
Sampler Initials:

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD

All results are calculated on a dry weight basis except where not applicable.

CONVENTIONAL PARAMETERS (SOIL)

Please note that the results have not been corrected for QC recoveries. Please note that the results have been corrected for the blank.
Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.

Maxxam Job #: A7A6398
Report Date: 2007/10/11

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE, NL
Your P.O. #: NSD016300
Sampler Initials:

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		U95043	U95044	U95046		
Sampling Date		2007/09/20	2007/09/20	2007/09/20		
COC Number		N/A	N/A	N/A		
Registration #						
	Units	RP-JW07-MW2	RP-JW07-MW3	RPFMW1	RDL	QC Batch

CHLOROENZENES						
1,2-Dichlorobenzene	ug/L	ND	ND	ND	0.5	1372779
1,3-Dichlorobenzene	ug/L	ND	ND	ND	1	1372779
1,4-Dichlorobenzene	ug/L	ND	ND	ND	1	1372779
Chlorobenzene	ug/L	ND	ND	ND	1	1372779
VOLATILES						
1,1,1-Trichloroethane	ug/L	ND	ND	ND	1	1372779
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	ND	1	1372779
1,1,2-Trichloroethane	ug/L	ND	ND	ND	1	1372779
1,1-Dichloroethane	ug/L	ND	ND	ND	2	1372779
1,1-Dichloroethylene	ug/L	ND	ND	ND	2	1372779
1,2-Dichloroethane	ug/L	ND	ND	ND	1	1372779
1,2-Dichloropropane	ug/L	ND	ND	ND	1	1372779
Benzene	ug/L	ND	2	ND	1	1372779
Bromodichloromethane	ug/L	ND	ND	ND	1	1372779
Bromoform	ug/L	ND	ND	ND	1	1372779
Bromomethane	ug/L	ND	ND	ND	8	1372779
Carbon Tetrachloride	ug/L	ND	ND	ND	1	1372779
Chloroethane	ug/L	ND	ND	ND	8	1372779
Chloroform	ug/L	ND	ND	ND	1	1372779
Chloromethane	ug/L	ND	ND	ND	8	1372779
cis-1,2-Dichloroethylene	ug/L	ND	ND	ND	2	1372779
cis-1,3-Dichloropropene	ug/L	ND	ND	ND	2	1372779
Dibromochloromethane	ug/L	ND	ND	ND	1	1372779
Ethylbenzene	ug/L	1	3	ND	1	1372779
Ethylene Dibromide	ug/L	ND	ND	ND	1	1372779
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	ND	3	1372779
o-Xylene	ug/L	3	5	ND	1	1372779
p+m-Xylene	ug/L	5	12	ND	2	1372779
Styrene	ug/L	ND	ND	ND	1	1372779
Tetrachloroethylene	ug/L	ND	ND	ND	1	1372779

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7A6398
Report Date: 2007/10/11

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE, NL
Your P.O. #: NSD016300
Sampler Initials:

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		U95043	U95044	U95046		
Sampling Date		2007/09/20	2007/09/20	2007/09/20		
COC Number		N/A	N/A	N/A		
Registration #						
	Units	RP-JW07-MW2	RP-JW07-MW3	RPFMW1	RDL	QC Batch

Toluene	ug/L	6	13	ND	1	1372779
trans-1,2-Dichloroethylene	ug/L	ND	ND	ND	2	1372779
trans-1,3-Dichloropropene	ug/L	ND	ND	ND	1	1372779
Trichloroethylene	ug/L	ND	ND	ND	1	1372779
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	ND	8	1372779
Vinyl Chloride	ug/L	ND	ND	ND	1	1372779
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	94	98	95		1372779
D4-1,2-Dichloroethane	%	105	103	106		1372779
D8-Toluene	%	99	101	99		1372779

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7A6398
Report Date: 2007/10/11

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE, NL
Your P.O. #: NSD016300
Sampler Initials:

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: A7C0154
Report Date: 2007/11/05

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

RESULTS OF ANALYSES OF WATER

Maxxam ID		V57564	V57577	V57578		
Sampling Date		2007/10/22	2007/10/22	2007/10/22		
COC Number		15304	15304	15304		
Registration #						
	Units	RPJW07-MW1	RMJW07-MW5	RMJW07-MW6	RDL	QC Batch

INORGANICS						
Strong Acid Dissoc. Cyanide (CN)	mg/L	ND	0.010	0.018	0.002	1397187
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V57579		
Sampling Date		2007/10/22		
COC Number		15304		
Registration #				
	Units	RMJW07-MW7	RDL	QC Batch

INORGANICS				
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.072	0.002	1397187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: A7C0154
Report Date: 2007/11/05

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

GENERAL COMMENTS

Sample V57564-01: The sample was decanted for Cyanide due to turbidity.
Sample V57577-01: The sample was decanted for Cyanide due to turbidity.
Sample V57578-01: The sample was decanted for Cyanide due to turbidity.
Sample V57579-01: The sample was decanted for Cyanide due to turbidity.

Results relate only to the items tested.

APPENDIX 2e

GPS Coordinates – Raymo Processing Facility

GPS Coordinates - NAD83 - Raymo Processing Facility

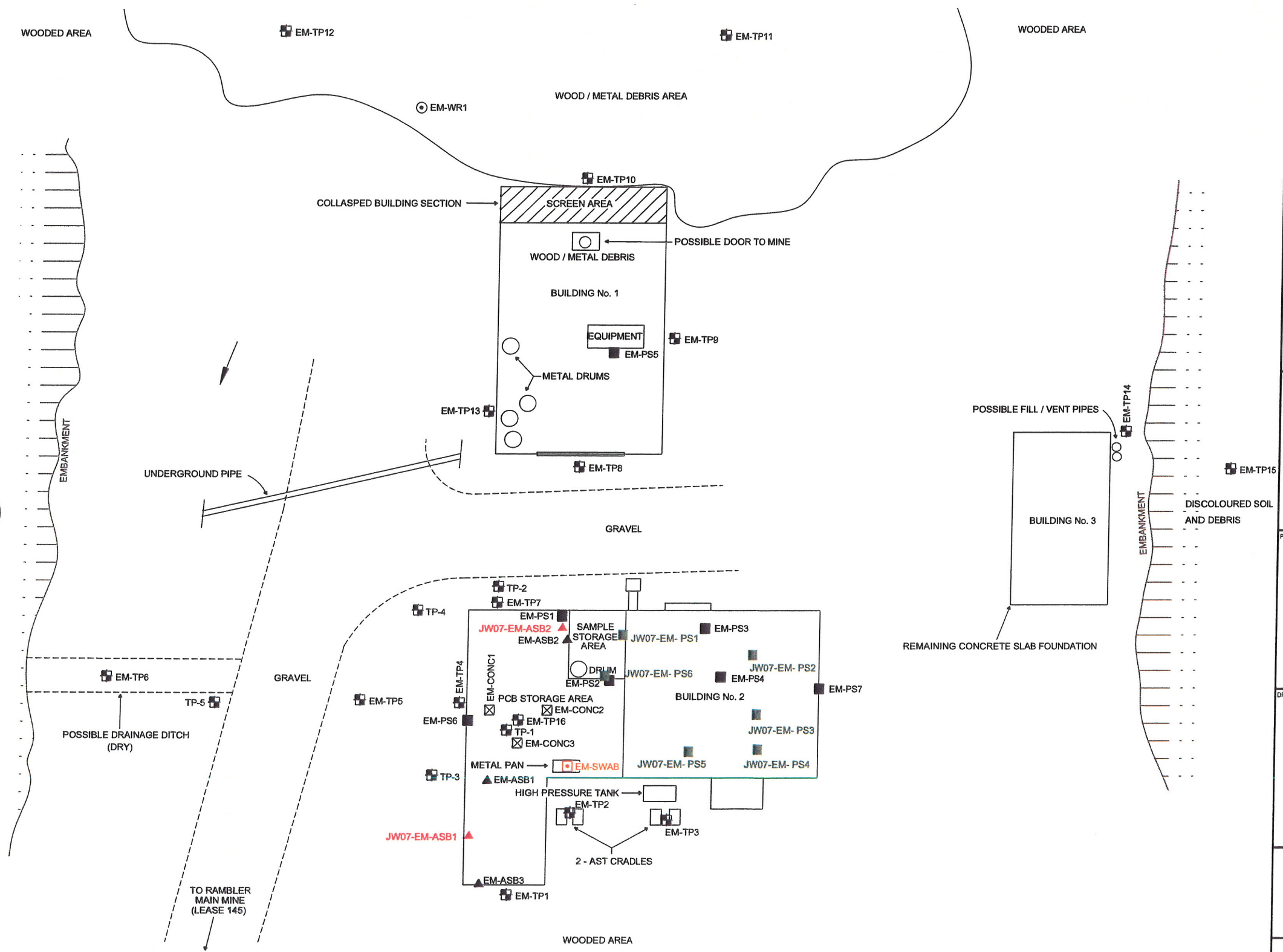
Location	Northing	Easting
RP-JW07-TP1	565470	5527046
RP-JW07-TP2	565461	5527043
RP-JW07-TP3	565449	5527054
RP-JW07-TP4	565373	5526995
RP-JW07-TP5	565377	5526998
RP-JW07-TP6	565388	5526995
RP-JW07-TP7	565400	5526995
RP-JW07-TP8	565411	5527013
RP-JW07-TP9	565498	5527075
RP-JW07-TP10	565509	5527076
RP-JW07-MW1	565377	5526993
RP-JW07-MW2	565439	5527118
RP-JW07-MW3	565457	5527129

APPENDIX 3a

Site Drawings – East Mine Area



NORTH



LEGEND

- GRAVEL ACCESS ROADS
- GROUNDWATER FLOW DIRECTION
- ⊕ MONITORING WELL LOCATION (AMEC 2006)
- ⊞ TEST PIT LOCATION (AMEC 2006)
- ⊞ JWEL TEST PIT LOCATION (AMEC 2006)
- ⊙ WASTE ROCK SAMPLE (AMEC 2006)
- ▲ ASBESTOS SAMPLE LOCATION (AMEC 2006)
- PAINT SAMPLE LOCATION (AMEC 2006)
- ⊠ CONCRETE SAMPLE LOCATION (AMEC 2006)
- ◻ SWAB SAMPLE LOCATION (AMEC 2006)
- ▲ ASBESTOS SAMPLE (JW 2007)
- PAINT SAMPLE (JW 2007)

NOTES:
 1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT & JW FIELD NOTES.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ESA & HAZARDOUS
 MATERIALS ASSESSMENT
 FORMER CONSOLIDATED RAMBLER MINE
 EAST MINE SITE, BAIE VERTE, NL**

DRAWING TITLE:
**SITE AND HAZARDOUS MATERIALS ASSESSMENT
 SAMPLE LOCATION PLAN
 EAST MINE AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	NTS	DATE:	DEC. 12, 2007
DRAWN BY:	S.N.	CHECKED BY:	
EDITED BY:		REV. No:	0
DRAWING No.:	1028976-EE-06		
CAD FILE:	1028976-EE-18.DWG		



APPENDIX 3b

Laboratory Analytical Results Summary Tables – East Mine Area
(Current Investigation & AMEC, 2007)

Table 3.1 Results of Laboratory Analyses for Asbestos - East Mine
 Hazardous Materials Assessment
 Former Consolidated Rambler Copper Mine, Baie Verte, NL
 Jacques Whitford Project No. 1028976

Sample No.	Location		Sample Description	Sample Analysis Results	Visually Similar Material Locations	Material Condition & Quantities
JW07-EM-ASB1	East Mine	Building No. 2	Exterior cladding	20-40% chrysotile asbestos	Throughout building	Approximately 200 sq.m. in GOOD condition
JW07-EM-ASB2		Building No. 2	Drywall joint compound	No asbestos concentration	Throughout building	N/A

Table 3.2 Results of Laboratory Analyses of Lead and Mercury in Paint - East Mine
Hazardous Materials Assessment
Former Consolidated Rambler Copper Mine, Baie Verte, NL
Jacques Whitford Project No. 1028976

Parameters	Location	Description	Condition	Lead	Lead Leachability	Mercury	Mercury Leachability	Polychlorinated Biphenyls (PCBs)
RDL				100	0.5	0.03	0.1	5
Units				mg/kg	mg/L	mg/kg	mg/L	mg/kg
Guideline¹				600	5	10	0.1	33
JW07-EM-PS1	East Mine Building No. 1	Interior grey paint on drywall	POOR	170	-	0.17	-	-
JW07-EM-PS2		Green paint on equipment (compressor)	POOR	36,000	15	0.19	-	-
JW07-EM-PS7		Blind duplicate of JW07-EM-PS2	-	40,000	15	0.21	-	-
JW07-EM-PS3		Grey paint on equipment (hoist)	POOR	4,800	2.9	0.38	-	-
JW07-EM-PS3 Lab. Dup.		-	-	5,000	-	-	-	-
JW07-EM-PS4		Grey on green on yellow on red on equipment (hoist)	POOR	35,000	8.4	0.43	-	-
JW07-EM-PS5		Red on grey on concrete blocks	POOR	610	nd	0.1	-	-
JW07-EM-PS6		Interior turquoise paint on plywood, steel and drywall	POOR	150	-	0.09	-	-

Notes:

1. Guideline = NLDEC guideline for disposal of lead-based painted construction debris in an approved municipal landfill; Hazardous Products Act guideline for mercury in paint; Environment Canada Table of Metals Leachate Toxicity for lead and mercury leachability; CCME guideline for a commercial property for PCBs.
2. RDL = Reportable Detection Limit
3. "-" = No applicable guideline/value
4. Bold/Shaded = Value exceeds applicable criteria

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 maximums outlined under The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 11/1998) 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	7296
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	10500 (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/kg

Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 500 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 underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg

Staded results indicate that mercury concentration is above the CSM CFCG 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 - Inferior Wall	Wood	Light Green Paint	0.005	

Notes:

MDL: Method detection limit

< X: Below MDL

Shaded results indicate that PCB concentration is above the CCME-CFOG 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	5.230

Notes:

MDL: Method detection limit

< X: Below MDL

Stated results indicate that lead concentration is above the relevant Transportation of Dangerous Goods Act (Updated 2012) 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:

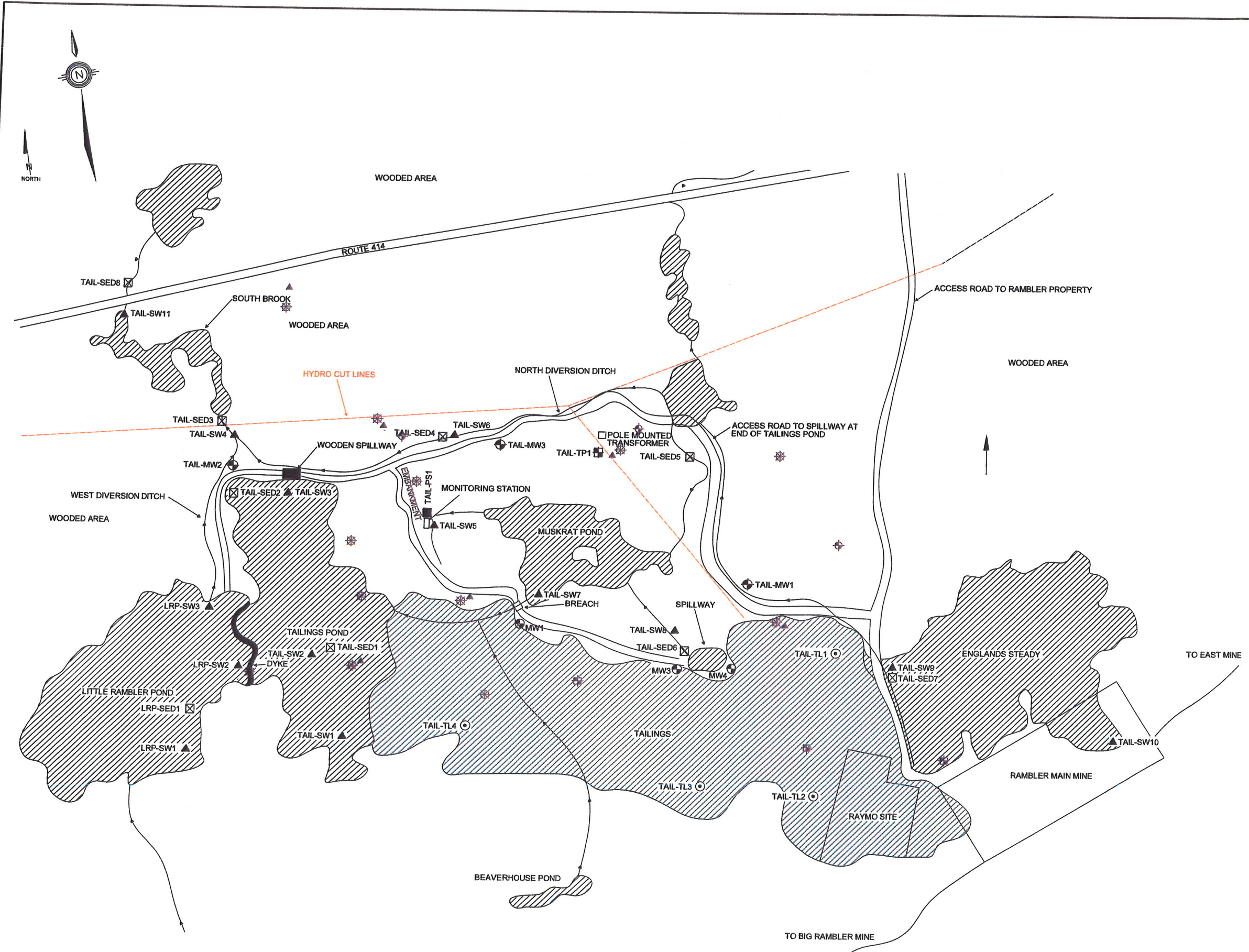
MDL: Method detection limit

< 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.

APPENDIX 4a

Site Drawings – Tailings Area



- LEGEND**
- STREAM / WATER BODY
 - GROUNDWATER FLOW DIRECTION
 - ⊕ MONITORING WELL LOCATION
 - ⊞ TEST PIT LOCATION
 - ⊙ JWEL STAND PIPE LOCATION
 - ▲ SURFACE WATER SAMPLE (AMEC 2006)
 - ⊙ TAILINGS SAMPLE LOCATION (AMEC 2006)
 - PAINT SAMPLE LOCATION (AMEC 2006)
 - ⊠ SEDIMENT SAMPLE LOCATION (AMEC 2006)

NOTES:
 1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT & JW FIELD NOTES.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ESA & HAZARDOUS
 MATERIALS ASSESSMENT
 FORMER CONSOLIDATED RAMBLER MINE
 TAILINGS AREA, BAIE VERTE, NL**

DRAWING TITLE:
**SITE & HAZARDOUS MATERIALS ASSESSMENT
 SAMPLE LOCATION PLAN
 TAILINGS AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	NTS	DATE:	DEC. 12, 2007
DRAWN BY:	S.N.	CHECKED BY:	
EDITED BY:	-	REV. No.:	0
DRAWING No.:	1028976-EE-07		
CAD FILE:	1028976-EE-26.DWG		



APPENDIX 4b

Laboratory Analytical Results Summary Tables - Tailings Area
(AMEC, 2007)

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 500 mg/kg

Table 5-2. Mercury in Paint - Tailings Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-10889	TAIL-PS1	Monitoring Station	Wood	Green	0.01	0.021

Notes:

MDL: Method detection limit

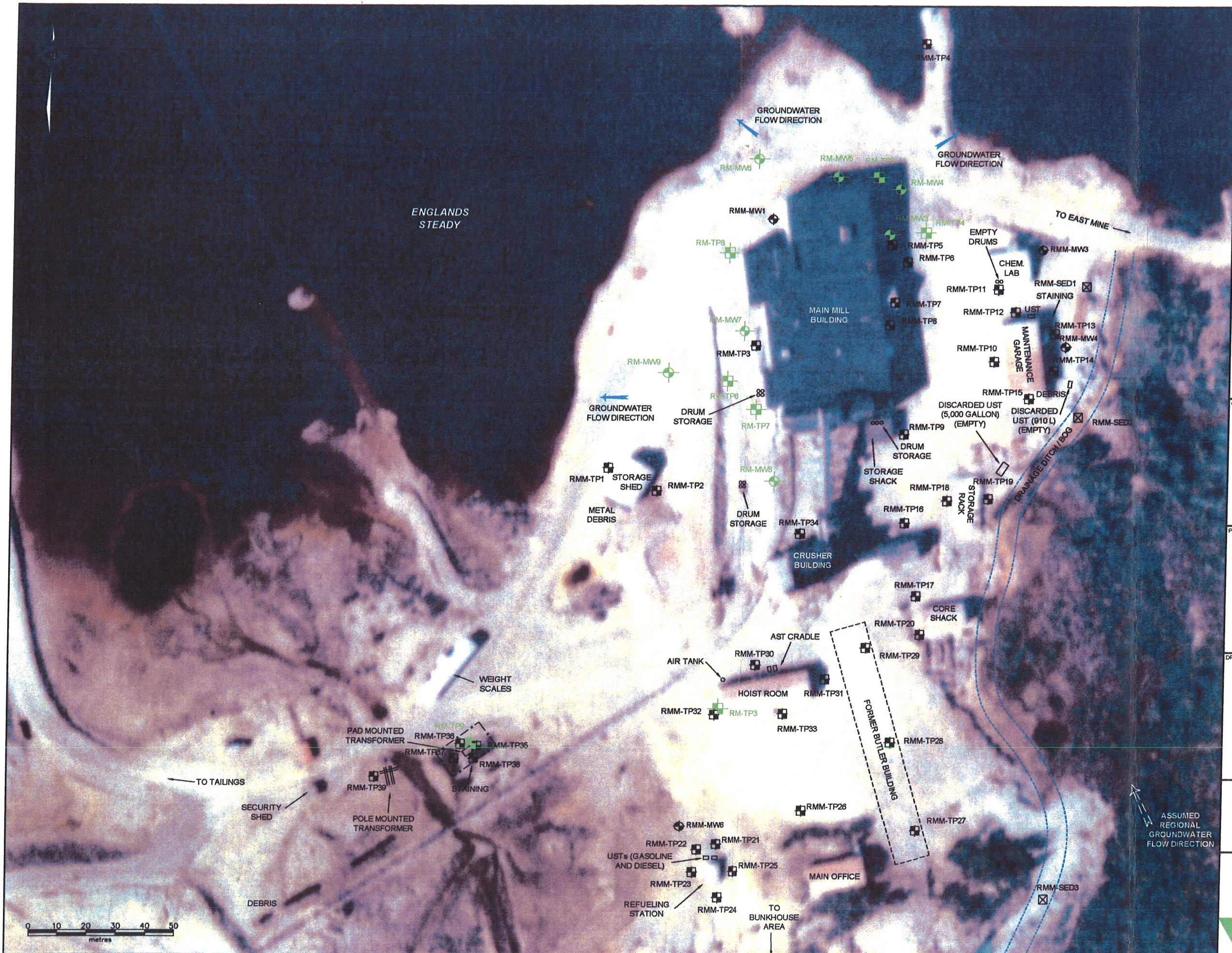
< X: Below MDL

Shaded 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 CGME-CEGC for a commercial product (23 mg/kg)

APPENDIX 5a

Site Drawings – Rambler Main Mine Area



- LEGEND**
- TEST PIT (CURRENT INVESTIGATION)
 - MONITOR WELL (CURRENT INVESTIGATION)
 - FORMER TEST PIT LOCATION (AMEC, 2007)
 - FORMER MONITOR WELL LOCATION (AMEC, 2007)
 - FORMER FRESHWATER SEDIMENT SAMPLE LOCATION (AMEC, 2007)

NOTES:
 1. DRAWING BASED ON 1999 AERIAL PHOTOGRAPHY.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
 3. © JACQUES WHITFORD, 2007.

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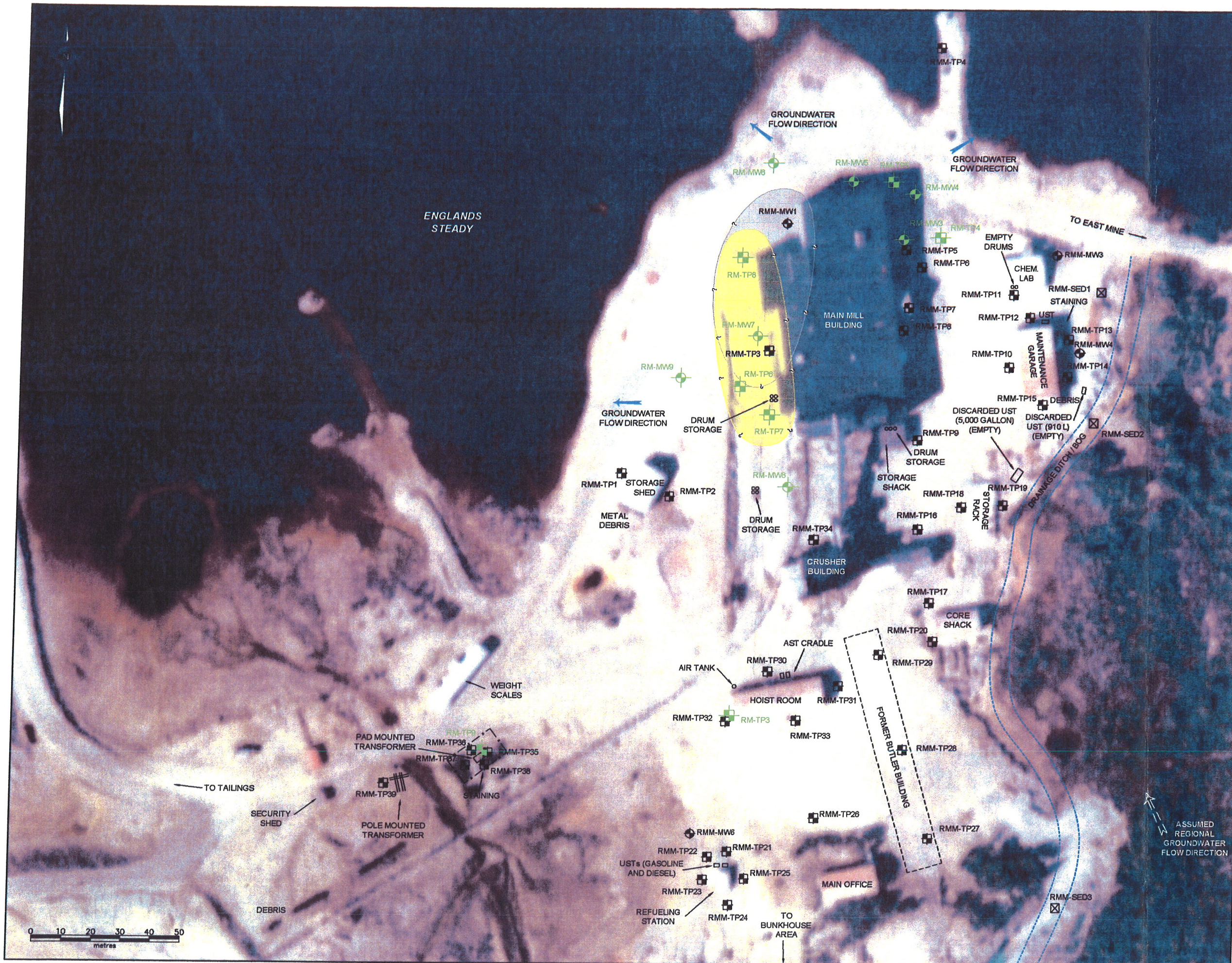
PROJECT TITLE:
**PHASE III ENVIRONMENTAL SITE
 ASSESSMENT, FORMER CONSOLIDATED
 RAMBLER MINE, BAIE VERTE, NL**

DRAWING TITLE:
**SITE AND PHASE III ESA
 SAMPLE LOCATION PLAN
 RAMBLER MAIN MINE AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE	1:1250	DATE	DEC. 12, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No.	0
DRAWING No.	1028976-EE-08		
CAD FILE	1028976-EE-06.DWG		





LEGEND

- TEST PIT (CURRENT INVESTIGATION)
- MONITOR WELL (CURRENT INVESTIGATION)
- FORMER TEST PIT LOCATION (AMEC, 2007)
- FORMER MONITOR WELL LOCATION (AMEC, 2007)
- FORMER FRESHWATER SEDIMENT SAMPLE LOCATION (AMEC, 2007)
- ESTIMATED EXTENT OF AREA WITH CYANIDE IN SOIL > CCME CRITERIA FOR AN INDUSTRIAL SITE (8 mg/kg)
- ESTIMATED EXTENT OF AREA WITH CYANIDE IN GROUNDWATER > MOE GUIDELINE (0.052 mg/L)

NOTES:
 1. DRAWING BASED ON 1999 AERIAL PHOTOGRAPHY.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
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NEWFOUNDLAND AND LABRADOR DEPARTMENT OF NATURAL RESOURCES

PHASE III ENVIRONMENTAL SITE ASSESSMENT, FORMER CONSOLIDATED RAMBLER MINE, BAIE VERTE, NL

ESTIMATED EXTENT OF CYANIDE IMPACTS IN SOIL AND GROUNDWATER RAMBLER MAIN MINE AREA

Jacques Whitford CONSULTING ENGINEERS



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EDITED BY:	-	REV. No:	0
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CAD FILE:	1028976-EE-25.DWG		



NORTH

- LEGEND**
- GRAVEL ACCESS ROADS
 - STREAM / WATER BODY
 - GROUNDWATER FLOW DIRECTION
 - ⊕ MONITORING WELL LOCATION (AMEC 2006)
 - ⊞ TEST PIT LOCATION (AMEC 2006)
 - ⊠ SEDIMENT SAMPLE LOCATION (AMEC 2006)
 - ▲ ASBESTOS SAMPLE (JW 2007)
 - PAINT SAMPLE (JW 2007)

NOTES:
 1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT & JW FIELD NOTES.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

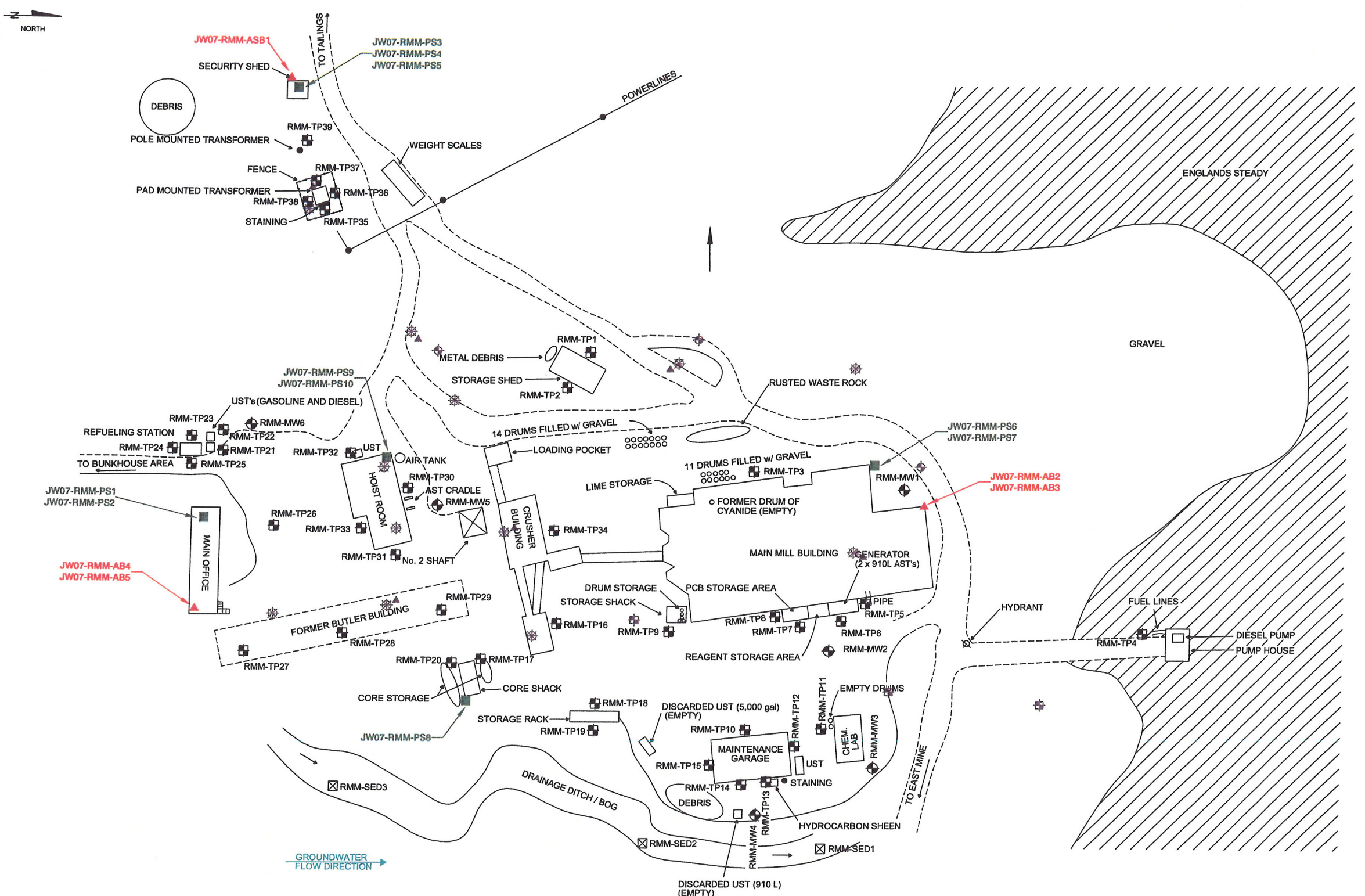
CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ESA & HAZARDOUS
 MATERIALS ASSESSMENT
 FORMER CONSOLIDATED RAMBLER MINE
 RAMBLER MAIN MINE, BAIE VERTE, NL**

DRAWING TITLE:
**HAZARDOUS MATERIALS ASSESSMENT
 SAMPLE LOCATION PLAN
 RAMBLER MAIN MINE AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	NTS	DATE:	DEC. 12, 2007
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EDITED BY:		REV. No:	0
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APPENDIX 5b

Test Pit & Monitor Well Records
& Symbols and Terms – Rambler Main Mine Area

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology Describing Common Soil Genesis

<i>Rootmat</i>	-	vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	-	mixture of soil and humus capable of supporting good vegetative growth
<i>Peat</i>	-	fibrous aggregate of visible and invisible fragments of decayed organic matter
<i>Loam</i>	-	silty sand or sand with silt mixed with organics matter
<i>Till</i>	-	unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	-	any materials below the surface identified as placed by humans (excluding buried services)

Terminology Describing Soil Structure

<i>Homogeneous</i>	-	same colour and appearance throughout
<i>Stratified</i>	-	composed of alternating successions of different soil types, e.g., silt and sand
<i>Lensed</i>	-	inclusion of small pockets of different soils
<i>Laminated</i>	-	alternating layers of varying material or colour with the layers less than 6 mm thick
<i>Layer</i>	-	thickness > 75 mm
<i>Seam</i>	-	thickness between 2 mm and 75 mm
<i>Parting</i>	-	thickness < 2 mm

Grain Size and Plasticity

Terminology describing soils on the basis of grain size and plasticity is based on the Unified Soil Classification System (USCS) (ASTM D-2487). The classification excludes particles larger than 76 mm (3 inches). This system provides a group symbol (e.g., SM) and group name (e.g., silty SAND) for identification. Note: terminology describing materials in the absence of laboratory analysis is based on the ASTM D-2488 visual method.

Terminology describing materials outside the USCS (e.g., particles larger than 76 mm, visible organic matter, construction debris) is based on the (visually estimated) proportion of these materials present:

<i>Trace, or occasional</i>	Less than approximately 10%
<i>Some</i>	approximately 10-20%
<i>Frequent</i>	Greater than approximately 20%

Standard Penetration Test 'N-Value'

The performance of the Standard Penetration Test provides an 'N-value'; the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (51 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration is achieved and 'N' values cannot be determined, the number of blows is reported over sampler penetration in millimetres (e.g., 50/75).

Density of Cohesionless Soils

The standard terminology to describe cohesionless soils includes the compactness (formerly "relative density"), as determined by laboratory test or by the Standard Penetration Test 'N- value'.

Density	N-Value	Compactness %
<i>Very Loose</i>	< 4	< 15
<i>Loose</i>	4-10	15-35
<i>Compact</i>	10-30	35-65
<i>Dense</i>	30-50	65-85
<i>Very Dense</i>	> 50	> 85

Consistency of Cohesive Soils

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		N-Value
	ksf	kPa	
<i>Very Soft</i>	< 0.25	< 12.5	< 2
<i>Soft</i>	0.25-0.5	12.5-25	2-4
<i>Firm</i>	0.5-1.0	25-50	4-8
<i>Stiff</i>	1.0-2.0	50-100	8-15
<i>Very Stiff</i>	2.0-4.0	100-200	15-30
<i>Hard</i>	> 4.0	> 200	> 30

ROCK DESCRIPTION

Rock Quality Designation (RQD)

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be applied to NW core; however, it can be used on different core sizes if most of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures.

RQD (%)	Rock Quality
90-100	Excellent - intact, very sound
75-90	Good - moderately jointed, massive, sound
50-75	Fair - fractured, blocky and seamy
25-50	Poor - severely fractured, shattered and very seamy or blocky
0-25	Very poor - very severely fractured, crushed

Total Core Recovery (TCR)

Total core recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

Weathering State

Term	Description
Slight	Weathering limited to the surface of major discontinuities. Typically iron stained.
Moderate	Weathering extends throughout rock mass. Rock is not friable.
High	Weathering extends throughout rock mass. Rock is friable (crumbles naturally or broken between fingers).

Terminology Describing Rock Mass

Spacing (mm)	Bedding, Laminations, Bands	Discontinuity
2000-6000	Very Thick	Very wide
600-2000	Thick	Wide
200-600	Medium	Moderately close
60-200	Thin	Close
20-60	Very Thin	Very close
< 20	Laminated	Extremely close
< 6	Thinly Laminated	

RECORD SYMBOLS AND ABBREVIATIONS

Sample Types

SS Split spoon sample (obtained by performing the Standard Penetration Test)

WS Wash sample
BS Bulk sample
RC Rock chip sample

ST Shelby tube or thin wall tube
HQ, NQ, BQ, etc. Rock core samples obtained using standard size diamond drilling bits.

Laboratory Tests

S Sieve analysis

H Hydrometer analysis

A Atterberg limits

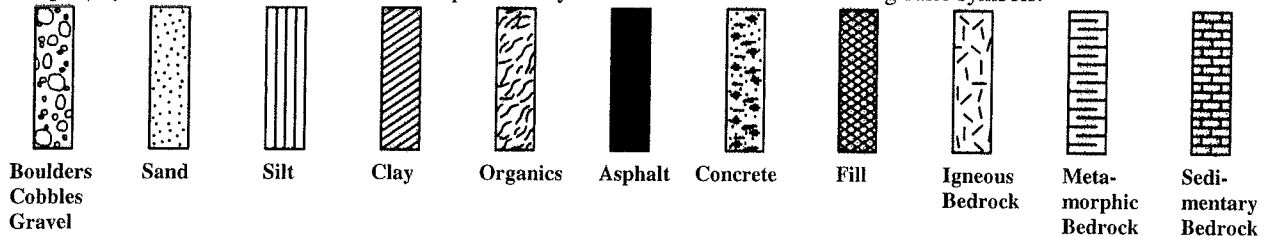
Water Level Measurement



Indicates recorded water level in a borehole, test pit or standpipe.

Strata Plot

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

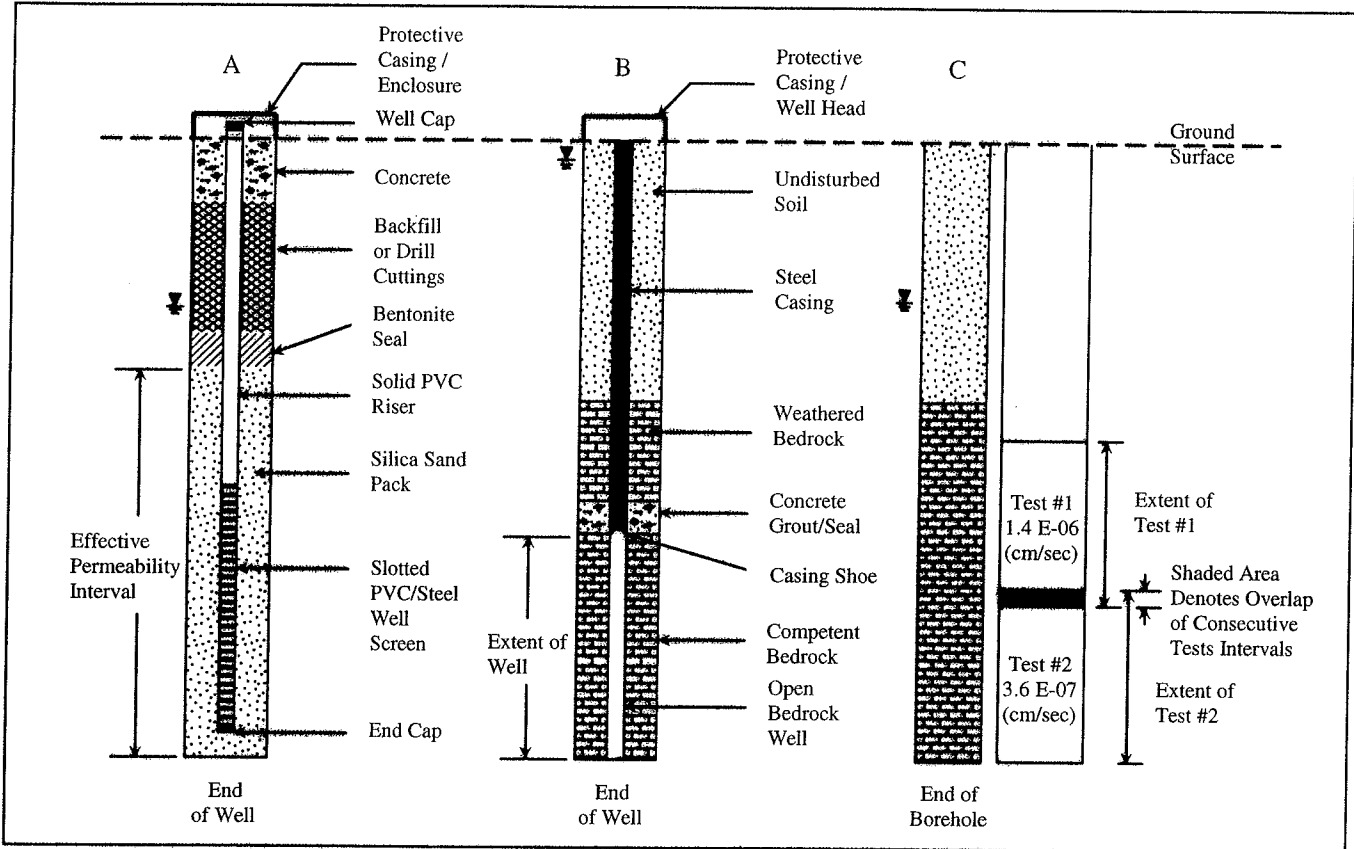


Solid lines between strata indicate the boundary between different strata. Dashed lines between strata indicate the boundary between strata is inferred.

SYMBOLS AND TERMS USED ON MONITOR WELL, WATER WELL AND ENVIRONMENTAL RECORDS

Well Construction and Permeability Testing

Basic symbols used in typical monitor or water well and piezometer construction are shown below. The well construction symbols or materials shown below may be combined or altered to suit a particular application. The diagram shows: A) a typical piezometer or monitor well in overburden; B) a typical water well in bedrock; C) borehole permeability test results in bedrock.



Apparent Moisture Content

Terminology used to describe apparent moisture content at the time of borehole drilling or test pit excavation.

Symbol	Description
D	Dry – containing little or no moisture
M	Moist – containing some moisture without having 'free' moisture
S	Saturated – 'free' moisture can drain from material

Terminology Describing Contamination

PID	-	Photo Ionization Detector (readings in ppm)
TPH	-	Total Petroleum Hydrocarbon concentration (readings in ppm based on mass)
ppm	-	Parts Per Million (measurement of concentration, mg/kg or mg/L)
nd	-	Not Detected – below limit of quantification (LOQ)

Apparent Hydrocarbon Odour

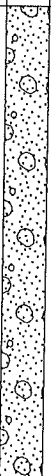
Terminology used to describe apparent hydrocarbon odour at the time of borehole drilling or test pit excavation.

Value	Description
0	No apparent odour
1	Slight odour
2	Moderate odour
3	Strong odour

JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment TEST PIT No. RMJW07-TP3
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, brown grey, SAND with gravel (SP); some cobbles and boulders												
				BS	1			1.6	-	-	-	-	-	
				BS	2			8.2	-	-	-	-	-	
1				BS	3			4.7	-	-	-	-	-	
				BS	4			9.2	2400	nd	nd	nd	nd	
2		End of Test Pit												
		Groundwater not encountered.												
		Bedrock encountered at 1.7 m depth.												
3														
4														
5														



TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment TEST PIT No. RMJW07-TP4
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)						
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES		
0		Loose to compact, grey brown silty SAND with gravel (SM)			BS	1			1.6	-	-	-	-	-		
					BS	2				4.8	-	-	-	-	-	-
1					BS	3				5.3	350	nd	nd	nd	nd	
		End of Test Pit Groundwater not encountered. Bedrock encountered at 1.2 m depth.														
2																
3																
4																
5																




JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A

TEST PIT No. RMJW07-TP5
 PROJECT No. 1028976
 DATUM _____

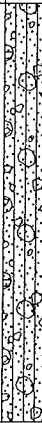
DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE
0		Compact, grey brown SAND with gravel (SP); occasional cobbles												
				BS	1				1.6	-	-	-	-	-
				BS	2				8.2	-	-	-	-	-
1		End of Test Pit												
		Groundwater not encountered.												
		Bedrock encountered at 1.0 m depth.												
2														
3														
4														
5														



JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment TEST PIT No. RMJW07-TP6
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, brown grey silty SAND with gravel (SM); some cobbles			BS	1			18.4	-	-	-	-	-
					BS	2			16.7	-	-	-	-	-
1					BS	3			14.2	-	-	-	-	-
					BS	4			28.7	8600	nd	nd	2.50	3.20
		End of Test Pit												
2		Groundwater encountered at ~1.3 m depth. Petroleum hydrocarbon sheen observed on groundwater and strong petroleum hydrocarbon odor on soil.												
3														
4														
5														



JACQUES WHITFORD

TEST PIT RECORD


CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment TEST PIT No. RMJW07-TP7
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL 1.3 m 9-5-07 DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)					
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	
0		Loose, brown grey silty SAND with gravel (SM); some cobbles and organics													
				BS	1			5.7	-	-	-	-	-	-	
				BS	2			12.8	-	-	-	-	-	-	
1				BS	3			10.1	-	-	-	-	-	-	
						BS	4			17.6	27000	nd	0.04	18.00	27.00
		End of Test Pit													
2		Groundwater encountered at ~1.3 m depth. Bedrock not encountered.													
		Petroleum hydrocarbon sheen observed on groundwater and strong petroleum hydrocarbon odor on soil.													
3															
4															
5															



TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment TEST PIT No. RMJW07-TP8
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL PROJECT No. 1028976
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON	ODOUR		OTHER TESTS	TPH	BENZENE	TOLUENE	ETHYLBENZENE
0		Compact, brown SAND with gravel (SP); some cobbles			BS	1			4.6	-	-	-	-	-
		End of Test Pit			BS	2			4.5	-	-	-	-	-
1		Groundwater not encountered. Bedrock encountered at ~0.4 m depth.												
2														
3														
4														
5														




JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment
 LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A

TEST PIT No. RMJW07-TP9
 PROJECT No. 1028976
 DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, grey brown SAND with gravel (SP)												
				BS	1			4.3	620	nd	nd	nd	nd	
				BS	2			3.5	-	-	-	-	-	
				BS	3			5.6	-	-	-	-	-	
1		End of Test Pit												
		Groundwater not encountered.												
		Bedrock encountered at ~0.9 m depth.												
		Petroleum hydrocarbon sheen observed on bedrock.												
2														
3														
4														
5														



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PROJECT Phase III ESA & Hazardous Materials Assessment

PROJECT No. 1028976

LOCATION Former Consolidated Rambler Mine - Bunkhouse Area

DRILLING METHOD Dia

DATES (mm-dd-yy): BORING 9-15-07

WATER LEVEL 1.92 m 9-20-07

SIZE HQ

DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Loose to compact, brownish-grey SILT (ML) with sand and gravel					mm						CAST IRON WELL HEAD
					SS	1	200	10	-	D	10.2	-	BACKFILL
					SS	2	300	18	-	D	14.6	-	BENTONITE
		Compact to very dense, brown SILT (ML) with sand and gravel; some fractured bedrock			SS	3	400	95/430	-	D	21.7	2500	
					RC	4	0	-	-	D	-	-	50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
		BEDROCK: Grey, felsic/mafic volcanics			RC	5	400	-	-	-	-	-	END CAP
		End of Borehole											



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PROJECT Phase III ESA & Hazardous Materials Assessment

PROJECT No. 1028976

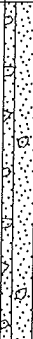
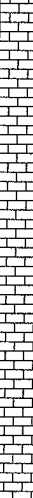
LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DRILLING METHOD Dia

DATES (mm-dd-yy): BORING 9-15-07 WATER LEVEL 1.23 m 9-20-07

SIZE HQ

DATUM Assumed

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	100.25	Compact to dense, brownish-grey SAND with silt and gravel (SP-SM)					mm						CAST IRON WELL HEAD BACKFILL BENTONITE 50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
					SS	1	0	5	-	-	-	-	
1	99.0	BEDROCK: Grey felsic/mafic volcanic bedrock		▼									END CAP
					SS	2	100	56/585	-	-	21.4	3000	
2					RC	3	0						
3	97.2				RC	4	950						
4		End of Borehole											
5		Heavy petroleum hydrocarbon sheen observed on bedrock.											



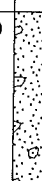
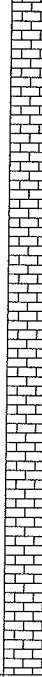
CLIENT Newfoundland and Labrador Department of Natural Resources

PROJECT Phase III ESA & Hazardous Materials Assessment

LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DATES (mm-dd-yy): BORING 9-16-07

WATER LEVEL 1.41 m 9-20-07

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	97.74	Compact, brownish-grey SAND with gravel (SP)				mm							CAST IRON WELL HEAD BACKFILL BENTONITE
	97.1				SS	1	250	31	-	-	3.1	610	
1		BEDROCK: Very severely fractured blackish-green mafic volcanic bedrock											50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
				RC	2	450		-	-	-	-		
				RC	3	450		-	-	-	-		
3	94.7	End of Borehole											END CAP
4													
5													





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PROJECT Phase III ESA & Hazardous Materials Assessment

LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DATES (mm-dd-yy): BORING 9-16-07 WATER LEVEL 0.49 m 9-20-07

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	99.15	Compact, greyish-brown SAND with gravel (SP)		▼			mm						CAST IRON WELL HEAD BACKFILL 50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK BENTONITE END CAP
	98.5				SS 1	150	12	-	W	3.6	-		
1		Dense, greyish-brown SAND with gravel (SP)		▼									
					SS 2	150	73/305	-	W	2.7	-		
2													
3	96.1	End of Borehole											
4													
5													



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PROJECT Phase III ESA & Hazardous Materials Assessment

PROJECT No. 1028976

LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DRILLING METHOD Auger

DATES (mm-dd-yy): BORING 9-16-07

WATER LEVEL 1.89 m 9-20-07

SIZE HS

DATUM Assumed

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	99.94	Compact, greyish-brown SAND with gravel (SP)					mm						CAST IRON WELL HEAD
					SS	1	200	9	-	D	6.8	-	
	99.3	Compact, brownish SAND with silt (SP-SM)											BENTONITE
1					SS	2	50	10	-	D	14.3	-	
		Compact, greenish-black GRAVEL (GP)											50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
2	98.1				SS	3	400	29	-	W	18.7	-	
		Compact, greenish-black GRAVEL (GP)											END CAP
3	96.9				SS	4	75	12	-	W	14.2	-	
		End of Borehole											
					SS	5	200	12	-	W	16.8	-	
4		End of Borehole											
5					SS								



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PROJECT Phase III ESA & Hazardous Materials Assessment

PROJECT No. 1028976



LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DRILLING METHOD Dia

DATES (mm-dd-yy): BORING 9-16-07 WATER LEVEL 1.78 m 9-20-07

SIZE HQ

DATUM Assumed

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	100.05	Compact to dense, brown-grey SILT (ML) with gravel		▼			mm						CAST IRON WELL HEAD BACKFILL BENTONITE 50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK END CAP
	SS				1	350	145/510	-	-	2.7	610		
1					SS	2	0						
					SS	3	0						
2	98.2	BEDROCK: Greenish-black mafic volcanic bedrock			SS	4	675	25%	-	-	-	-	
3	97.0												
4													
5													



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PROJECT Phase III ESA & Hazardous Materials Assessment

PROJECT No. 1028976

LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DRILLING METHOD Dia

DATES (mm-dd-yy): BORING 9-16-07

WATER LEVEL 1.72 m 9-20-07

SIZE HQ

DATUM Assumed

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	100.00	Very dense, greyish-brown GRAVEL (GP) with very fractured rock		▼			mm						CAST IRON WELL HEAD BACKFILL BENTONITE 50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK END CAP
	SS				1	200	118/480	-	D	14.7	31		
1					SS	2	0	-	-	-	-	-	
2					RC	3	0	-	-	-	-	-	
3					RC	4	0	-	-	-	-	-	
3	97.0	End of Borehole											
4													
5													



CLIENT Newfoundland and Labrador Department of Natural Resources

PROJECT Phase III ESA & Hazardous Materials Assessment

LOCATION Former Consolidated Rambler Mine - Rambler Main Mine Site, Baie Verte, NL

DATES (mm-dd-yy): BORING 9-16-07 WATER LEVEL 1.72 m 9-20-07

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0	100.51						mm						CAST IRON WELL HEAD
		Dense, brown-grey GRAVEL (GP)			SS	1	350	32	-	D	4.1	-	BACKFILL
	99.9												
		Compact to dense SILT (ML)			SS	2	350	38	-	D	6.8	-	BENTONITE
1					SS	3	300	6	-	D	3.7	-	
	98.7			▼									50 mm DIAMETER No. 10 SLOT PVC SCREEN IN No. 2 SILICA SAND PACK
		Compact, grey-green GRAVEL with silt (GP-GM)			SS	4	75	4	-	W	5.9	25	
2					SS	5	75	5	-	W	7.2	-	
3					SS	6	0	-	-	-	-	-	
4													END CAP
	95.9												
5		End of Borehole Heavy petroleum hydrocarbon sheen observed on groundwater.											



APPENDIX 5c

Laboratory Analytical Results Summary Tables – Rambler Main Mine Area
(Current Investigation & AMEC, 2007)

Table 5.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Rambler Main Mine Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Rambler Main Mine
Bate Verte, NL
JW Project No. 1028976

Parameters	Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10 (Gas Range)	C10-C21 (Fuel Range)	C21-C32 (Lube Range)	Modified TPH - Tier 1 ³	Resemblance
RDL	0.03	0.03	0.03	0.05	3	15	15	20	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Criteria ¹	1.8	160	430	200	na	na	na	7,400	
Criteria ²	1.8	160	430	200	na	na	na	10,000	
RM-JW07-TP3-BS4	nd	nd	nd	nd	nd	1,800	640	2,400	WFO, LO
RM-JW07-TP4-BS3	nd	nd	nd	nd	nd	78	280	350	FO, LO
RM-JW07-TP5-BS3	nd	nd	nd	nd	nd	26	nd	26	FO
RM-JW07-TP6-BS4	nd	nd	2.5	3.2	1,400	7,000	150	8,600	FO, LO
RM-JW07-TP7-BS4	nd	0.04	18	27	1,800	25,000	430	27,000	WFO
RM-JW07-TP7-BS4 Lab-Dup	nd	nd	16	25	1,700	23,000	410	-	WFO
RM-JW07-TP9-BS1	nd	nd	nd	nd	4	310	300	620	FO, LO
RM-JW07-MW3-SS2	nd	nd	nd	nd	nd	200	2,800	3,000	LO
RM-JW07-MW4-SS1	nd	nd	nd	nd	nd	65	550	610	LO
RM-JW07-MW8-SS1	nd	nd	nd	nd	nd	nd	31	31	LO
Duplicate #4	nd	nd	nd	nd	nd	nd	43	43	LO
RM-JW07-MW9-SS4	nd	nd	nd	nd	nd	nd	25	25	LO

Notes:

- 1 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for commercial site with non-potable groundwater, coarse-grained soil and fuel oil impacts
- 2 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for a commercial site with non-potable groundwater, coarse-grained soil and lube oil impacts
- 3 = Modified TPH - Tier I does not include BTEX
- RDL = Reportable detection limit
- nd = Not detected above standard RDL
- na = No applicable criteria
- Duplicate #4 = JW field QA/QC duplicate sample of RM-JW07-MW8-SS1
- FO = Fuel oil; WFO = Weathered fuel oil; LO = Lube oil fraction
- Shaded = Values exceeds applicable PIRI RBSL for fuel oil

**Table 5.2 Results of Laboratory Analysis of PCBs in Soil - Rambler Main Mine Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Rambler Main Mine
Baie Verte, NL
JW Project No. 1028976**

Parameter	Polychlorinated Biphenyls (PCBs)
RDL	0.05
Units	mg/kg
Criteria ¹	33
RM-JW07-TP3-BS4	nd
RM-JW07-TP9-BS1	nd

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site

RDL = Reportable detection limit

nd = Not detected above standard RDL

**Table 5.3 Results of Laboratory Analysis of Cyanide in Soil - Rambler Main Mine Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Rambler Main Mine
Baie Verte, NL
JW Project No. 1028976**

Parameter	Total Cyanide
RDL	0.5
Units	mg/kg
Criteria ¹	8
RM-JW07-TP6-BS4	17
RM-JW07-TP7-BS2	8
RM-JW07-TP8-BS1	21
RM-JW07-MW5-SS1	8.9
RM-JW07-MW6-SS3	nd
Duplicate #3	nd
RM-JW07-MW7-SS1	1.3

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site (free cyanide)

RDL = Reportable detection limit

nd = Not detected above standard RDL

Duplicate #3 = JW field QA/QC duplicate sample

Shaded = Value exceeds applicable criteria

Table 5.4 Results of Laboratory Analysis of TPH in Groundwater - Rambler Main Mine Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Rambler Main Mine
Baie Verte, NL
JW Project No. 1028976

Parameters	RDL	Units	Criteria ¹	RM-JW07-MW3	RM-JW07-MW4	RM-JW07-MW7	RM-JW07-MW8	RM-JW07-MW9
Benzene	0.001	mg/L	6.9	nd	nd	0.002	nd	0.003
Toluene	0.001	mg/L	20	0.005	0.002	0.001	0.007	0.003
Ethylbenzene	0.001	mg/L	20	nd	nd	0.047	0.035	0.064
Xylenes	0.002	mg/L	20	0.006	0.002	0.06	0.12	0.091
C6-C10 (Gas Range)	0.01	mg/L	na	nd	nd	0.67	0.69	0.66
C10-C21 (Fuel Range)	0.05	mg/L	na	0.4	0.17	5	1.3	4.8
C21-C32 (Lube Range)	0.1	mg/L	na	2.3	0.5	0.5	0.2	9
Modified TPH - Tier I ²	0.1	mg/L	20	2.7	0.6	6.2	2.2	14
Resemblance				LO	FO, LO	FO	NP	WFO, LO

Notes:

1 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for groundwater at a commercial site with non-potable groundwater and coarse-grained soil

2 = Modified TPH - Tier I does not include BTEX

RDL = Reportable detection limit

nd = Not detected above standard RDL

na = No applicable criteria

"." = Parameter not analyzed

FO = Fuel oil; WFO = Weathered fuel oil; LO = Lube oil; NP = Non-petrogenic

**Table 5.5 Results of Laboratory Analysis of Cyanide in Groundwater - Rambler Main Mine Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Rambler Main Mine
Baie Verte, NL
JW Project No. 1028976**

Parameter	Total Cyanide
RDL	0.002
Units	mg/L
Criteria ¹	0.052
RM-JW07-MW5	0.01
RM-JW07-MW6	0.018
RM-JW07-MW7	0.072

Notes:

1 = Ontario Ministry of the Environment (MOE) Groundwater Standards for Use Under Part XV.1 of the Environmental Protection Act for a full depth generic site with non-potable groundwater (Table 3).
(free cyanide)

RDL = Reportable detection limit

nd = Not detected above standard RDL

Shaded = Value exceeds applicable criteria

Table 5.6 Results of Laboratory Analyses for Asbestos - Rambler Main Mine Area
Hazardous Materials Assessment
Former Consolidated Rambler Copper Mine, Baie Verte, NL
Jacques Whitford Project No. 1028976

Sample No.	Location	Sample Description	Sample Analysis Results	Visually Similar Material Locations	Material Condition & Quantities	
JW07-RMM-ASB1	Rambler Main Mine	Security shed	Brown/yellow floor covering	1-5% chrysotile asbestos	Throughout building	Approximately 9 sq.m. in POOR condition
JW07-RMM-ASB2		Mill Building	Exterior siding	No asbestos concentration	Throughout building	N/A
JW07-RMM-ASB3		Hoist Building	Pipe insulation (aircell)	10-20% chrysotile asbestos	Throughout building	Approximately 30 m in POOR condition
JW07-RMM-ASB4		Main Office	Ceiling tile	No asbestos concentration	Throughout building	N/A
JW07-RMM-ASB5		Main Office	Floor covering	1-5% chrysotile asbestos	Throughout building	Approximately 200 sq.m. in POOR condition

Table 5.7 Results of Laboratory Analyses of Lead and Mercury in Paint - Rambler Main Mine Area
Hazardous Materials Assessment
Former Consolidated Rambler Copper Mine, Baie Verte, NL
Jacques Whitford Project No. 1028976

Parameters	Location	Description	Condition	Lead	Lead Leachability	Mercury	Mercury Leachability	Polychlorinated Biphenyls (PCBs)
RDL				100	0.5	0.03	0.1	5
Units				mg/kg	mg/L	mg/kg	mg/L	mg/kg
Guideline¹				600	5	10	0.1	33
JW07-RMM-PS1	Main Mine	Main Office	Exterior trim turquoise paint on wood eaves	GOOD	16,000	9.4	0.42	-
JW07-RMM-PS2		Main Office	Interior white paint on wallboard	GOOD	110	-	nd	-
JW07-RMM-PS3		Security shed	Interior blue paint on wood plywood walls	POOR	1,600	nd	1.9	-
JW07-RMM-PS4		Security shed	Interior yellow paint on wood plywood walls	POOR	2,700	nd	5.8	-
JW07-RMM-PS5		Security shed	Interior white paint on plywood walls	POOR	340	-	3.5	-
JW07-RMM-PS6		Mill Building	Green paint on exterior doors	GOOD	2,600	0.6	0.07	-
JW07-RMM-PS7		Mill Building	Exterior beige paint on siding	GOOD	nd	-	0.05	-
JW07-RMM-PS8		Core Shack	Interior turquoise paint on drywall	GOOD	80	-	nd	-
JW07-RMM-PS11		-	Blind duplicate on JW07-RMM-PS8	-	nd	-	nd	-
JW07-RMM-PS9		Hoist Building	Exterior yellow paint on siding	GOOD	190	-	0.04	-
JW07-RMM-PS10	Hoist Building	Red paint on roof	GOOD	71	nd	0.05	-	

Notes:

1. Guideline = NLDEC guideline for disposal of lead-based painted construction debris in an approved municipal landfill; Hazardous Products Act guideline for mercury in paint; Environment Canada Table of Metals Leachate Toxicity for lead and mercury leachability; CCME guideline for a commercial property for PCBs.
2. RDL = Reportable Detection Limit
3. "-" = No applicable guideline/value
4. Bold/Shaded = Value exceeds applicable criteria

Table 6-1: BTEX/TPH in Soil - Rambler Main Mine

AVERAGE SAMPLING DEPTH (m)	LAB ID	FIELD ID	DATE (D/M/Y)	DATA						GUIDELINES							
				Lab Blank	1.5 - 2.5 S2006-10579 RMM-TP1-SS2	1.0 - 1.8 S2006-10580 RMM-TP2-SS2	1.0 - 1.8 S2006-10595 DUP 3	1.0 - 1.75 S2006-10596 RMM-TP3-SS2	0 - 1.0 S2006-10597 RMM-TP4-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)	2003 ATLANTIC PIRI TIER 1 RBSL ¹			
				(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
PARAMETERS	MDL (mg/kg)																
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	1.8	1.8	1.8	1.8	1.8	1.8
Toluene	0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.37	160	160	160	160	160	160
Ethylbenzene	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.082	430	430	430	430	430	430
Total Xylenes	0.06	0.26	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	11	200	200	200	200	200	200
TPH (C6-C10)	10	14	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-	-
TPH (>C10-C21)	10	26	<10	<10 (<10)	<10	<10	<10	<10	<10	25	-	-	-	-	-	-	-
TPH (>C21-C32)	50	234	<50	<50 (<50)	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-	-
Modified TPH (C6-C32)	70	274	<70	<70	<70	<70	<70	<70	<70	<85	-	450	7400	7400	7400	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 1 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

AVERAGE SAMPLING DEPTH (m)	DATA						GUIDELINES		
	0 - 1.0 S2006-10598 RMM-TP5-SS1	0 - 0.35 S2006-10599 RMM-TP6-SS1	1.0 - 1.4 S2006-10600 RMM-TP7-SS2	0 - 0.7 S2006-10603 RMM-TP10-SS1	1.0 - 2.0 S2006-10604 RMM-TP11-SS2	0 - 1.0 S2006-10605 RMM-TP12-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹	
LAB ID	0 - 1.0 S2006-10598 RMM-TP5-SS1	0 - 0.35 S2006-10599 RMM-TP6-SS1	1.0 - 1.4 S2006-10600 RMM-TP7-SS2	0 - 0.7 S2006-10603 RMM-TP10-SS1	1.0 - 2.0 S2006-10604 RMM-TP11-SS2	0 - 1.0 S2006-10605 RMM-TP12-SS1	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)
FIELD ID	0 - 1.0 S2006-10598 RMM-TP5-SS1	0 - 0.35 S2006-10599 RMM-TP6-SS1	1.0 - 1.4 S2006-10600 RMM-TP7-SS2	0 - 0.7 S2006-10603 RMM-TP10-SS1	1.0 - 2.0 S2006-10604 RMM-TP11-SS2	0 - 1.0 S2006-10605 RMM-TP12-SS1	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)
DATE (D/M/Y)	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06			
PARAMETERS	MDL (mg/kg)	MDL (mg/kg)	MDL (mg/kg)	MDL (mg/kg)	MDL (mg/kg)	MDL (mg/kg)			
Benzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	1.8	1.8
Toluene	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	0.37	160	160
Ethylbenzene	0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.082	430	430
Total Xylenes	0.06	0.26	<0.06	<0.06	<0.06	<0.06	11	200	200
TPH (C6-C10)	<10	<10	16	<10	<10	<10	-	-	-
TPH (>C10-C21)	10	<10	183	<10	<10	3340	-	-	-
TPH (>C21-C32)	50	587	<50	110	<50	632	-	-	-
Modified TPH (C6-C32)	70	<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

AVERAGE SAMPLING DEPTH (m)	DATA						GUIDELINES			
	1.0 - 1.5 S2006-10606 RMM-TP13-SS2	0 - 1.0 S2006-10607 RMM-TP14-SS1	0 - 0.9 S2006-10608 RMM-TP15-SS1	0.3 - 0.6 S2006-10609 RMM-TP16-SS1	2.0 - 2.8 S2006-10613 RMM-TP17-SS3	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹			
LAB ID	DATE (D/M/Y)	MDL (mg/kg)	07-Sep-06 (mg/kg)	07-Sep-06 (mg/kg)	07-Sep-06 (mg/kg)	08-Sep-06 (mg/kg)	GASOLINE (mg/kg)	DIESEL/#2 (mg/kg)	#6 OIL (mg/kg)	
Benzene		0.01	<0.01	<0.01	<0.01	<0.01	1.8	1.8	1.8	
Toluene		0.01	0.04	<0.01	<0.01	0.05	160	160	160	
Ethylbenzene		0.02	0.03	<0.02	<0.02	<0.02	430	430	430	
Total Xylenes		0.06	0.26	<0.06	<0.06	<0.06	200	200	200	
TPH (C6-C10)		10	<10	21	<10	<10	-	-	-	
TPH (>C10-C21)		10	<10	294	<10	<10	-	-	-	
TPH (>C21-C32)		50	<50	462	<50	51	-	-	-	
Modified TPH (C6-C32)		70	<70	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

AVERAGE SAMPLING DEPTH (m)	DATA					GUIDELINES			
	1.0 - 1.9 S2006-10614 RMM-TP18-SS2	0 - 0.25 S2006-10615 RMM-TP19-SS1	2.6 - 3.0 S2006-10616 RMM-TP20-SS4	1.8 - 2.4 S2006-10617 RMM-TP21-SS3	0 - 1.0 S2006-10618 RMM-TP22-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹		
DATE (D/M/Y)	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06		GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)
PARAMETERS	MDL (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	1080	<10	238	23	-	-	-	-
TPH (>C21-C32)	50	4940	<50	93	150	-	-	-	-
Modified TPH (C6-C32)	70	<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

AVERAGE SAMPLING DEPTH (m)	DATA				GUIDELINES			
	2.0 - 3.0 S2006-10619 RMM-TP23-SS3	0 - 0.8 S2006-10620 RMM-TP24-SS3	0 - 0.8 S2006-10626 DUP 6	0 - 1.0 S2006-10621 RMM-TP25-SS1	0 - 0.8 S2006-10622 RMM-TP26-SS1	1999 CCME-CEQG (Updated 2006) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹	
LAB ID	DATE (D/M/Y)	MDL (mg/kg)	08-Sep-06 (mg/kg)	08-Sep-06 (mg/kg)	08-Sep-06 (mg/kg)	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)
Benzene		0.01	<0.01	<0.01	<0.01	0.03	1.8	1.8
Toluene		0.05	<0.01	<0.01	<0.01	0.37	160	160
Ethylbenzene		0.28	<0.02	<0.02	<0.02	0.082	430	430
Total Xylenes		6.72	<0.06	<0.06	<0.06	11	200	200
TPH (C6-C10)		34	<10	<10	<10	-	-	-
TPH (>C10-C21)		987	2700	2610	28	-	-	-
TPH (>C21-C32)		50	1400	1490	200	-	-	-
Modified TPH (C6-C32)		70	<4110	<4110	<238	-	-	-
Hydrocarbon Identification			Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	450	7400	10000

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

AVERAGE SAMPLING DEPTH (m)	DATA					GUIDELINES			
	0 - 0.9 S2006-10623 RMM-TP27-SS1	1.0 - 2.0 S2006-10624 RMM-TP28-SS2	3.0 - 3.4 S2006-10625 RMM-TP29-SS4	1.2 - 1.8 S2006-10628 RMM-MW6-SS3	0 - 1.0 S2006-10645 RMM-TP30-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹		
DATE (D/M/Y)	08-Sep-06	08-Sep-06	08-Sep-06	08-Sep-06	09-Sep-06		GASOLINE (mg/kg)	DIESEL/#2 (mg/kg)	#6 OIL (mg/kg)
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	0.57	<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	83	<10	-	-	-	-
TPH (>C10-C21)	10	<10	2670	1700	33	-	-	-	-
TPH (>C21-C32)	50	<50	513	122	335	-	-	-	-
Modified TPH (C6-C32)	70	<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-CEQCs**
- 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

AVERAGE SAMPLING DEPTH (m)	LAB ID	FIELD ID	DATA					GUIDELINES		
			0 - 0.75 S2006-10646 RMM-TP31-SS1	0 - 0.4 S2006-10647 RMM-TP32-SS1	0 - 0.4 S2006-10650 DUP 7	0 - 0.5 S2006-10648 RMM-TP33-SS1	0 - 0.8 S2006-10649 RMM-TP34-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)
DATE (D/M/Y)	MDL (mg/kg)	09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	09-Sep-06	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
PARAMETERS										
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	1340	1450	53	53	-	-	-	-
TPH (>C21-C32)	50	437	685	1060	392	392	-	-	-	-
Modified TPH (C6-C32)	70	<541	<2040	<2520	<455	<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 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 6-14: PCBs in Soil - Rambler Main Mine

AVERAGE SAMPLING DEPTH (m)		DATA							GUIDELINES
LAB ID		1.0 - 1.4	0 - 1.0	3.0 - 4.0	0 - 1.0	0 - 1.0	0 - 0.3		
FIELD ID		S2006-10600	S2006-10601	S2006-10625	S2006-10645	S2006-10683			
DATE (D/M/Y)		RMM-TP7-SS2	RMM-TP8-SS1	RMM-TP29-SS4	RMM-TP30-SS1	RMM-TP35-SS1			
PARAMETERS	MDL (mg/kg)	07-Sep-06	07-Sep-06	08-Sep-06	09-Sep-06	11-Sep-06			
Polychlorinated Biphenyls	0.005	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)			
		<0.005	<0.005	<0.005	<0.005	<0.005			
								1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)	
								(mg/kg)	
								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

AVERAGE SAMPLING DEPTH (m)	DATA				GUIDELINES
	0 - 0.3	0 - 0.3	0 - 0.3	0 - 0.3	
LAB ID	S2006-10884	S2006-10885	S2006-10886	S2006-10887	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
FIELD ID	RMM-TP36-SS1	RMM-TP37-SS1	RMM-TP38-SS1	RMM-TP39-SS1	
DATE (D/M/Y)	11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
Polychlorinated Biphenyls	<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

AVERAGE SAMPLING DEPTH (m)		DATA					GUIDELINES
LAB ID		1.0 - 1.75	0 - 1.0	0 - 0.35	1.0 - 1.4		
FIELD ID		S2006-10596	S2006-10598	S2006-10599	S2006-10600		
DATE (D/M/Y)		RMM-TP3-SS2	RMM-TP5-SS1	RMM-TP6-SS1	RMM-TP7-SS2		
PARAMETERS	MDL (mg/kg)	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06		
Cyanide	0.001	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		
		21.0	0.629	2.66	0.034		
							1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005) (mg/kg)
							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

AVERAGE SAMPLING DEPTH (m)	DATA				GUIDELINES
	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 SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
FIELD ID	RMM-TP8-SS1	DUP 11	RMM-TP9-SS1	DUP 4	
DATE (D/M/Y)	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
Cyanide	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

AVERAGE SAMPLING DEPTH (m)		DATA				GUIDELINES
		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 SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
FIELD ID	RMM-TP11-SS2	RMM-TP13-SS2	RMM-TP16-SS1	RMM-TP18-SS2		
DATE (D/M/Y)	07-Sep-06	07-Sep-06	07-Sep-06	07-Sep-06		
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		
Cyanide	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

LAB ID FIELD ID DATE (D/M/Y)	MDL (µg/L)	DATA										GUIDELINES	
		Lab Blank (µg/L)	S2006-10852 RMM-MW1 12-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)	S2006-10856 RMM-MW5 13-Sep-06 (µg/L)	S2006-10857 RMM-MW6 13-Sep-06 (µg/L)	CCME CEQGs (REVISED 2005) FAL (µg/L)	2003 ATLANTIC PIRI TIER I RBSL*			
PARAMETERS													
Benzene	0.4	<0.4	<0.4	<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	<0.4	<0.4	<0.4	0.3	2	20000
Ethylbenzene	0.6	<0.6	<0.6	<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	0.9	0.9	0.9	0.9	0.9	3.5	-	20000
TPH (C6-C10)	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-
TPH (>C10-C21)	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	1260	-	-
TPH (>C21-<C32)	50	<50	<50	<50	<50	<50	<50	52	<50	<50	<50	-	-
Modified TPH (C6-C32)	150	<150	<150	<150	<150	<150	<150	<152	<150	<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 6-21: Cyanide in Groundwater - Rambler Main Mine

Lab ID	FIELD ID	DATE	PARAMETERS	MDL (mg/L)	Lab Blank	S2006-10852 RMM-MW1 12-Sep-06 (mg/L)	S2006-10853 RMM-MW2 13-Sep-06 (mg/L)	S2006-10854 RMM-MW3 13-Sep-06 (mg/L)	S2006-10855 RMM-MW4 13-Sep-06 (mg/L)	S2006-10856 RMM-MW5 13-Sep-06 (mg/L)	S2006-10857 RMM-MW6 13-Sep-06 (mg/L)	GUIDELINES
Cyanide				0.001	(mg/L) <0.001	0.148	0.002	0.002	0.002	<0.001	0.001	CCME-CEQGs (REVISED 2005) FAL (mg/L) 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**

APPENDIX 5d

Maxxam Analytics Inc. Analytical Reports – Rambler Main Mine Area
(Current Investigation)

Maxxam Job #: A799260
Report Date: 2007/11/30

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		U62742	U62914	U62915		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP1-BS2	RM-JW07-TP2-BS1	RM-JW07-TP3-BS4	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/kg	ND	ND	ND	0.03	1360693
Toluene	mg/kg	ND	ND	ND	0.03	1360693
Ethylbenzene	mg/kg	ND	ND	ND	0.03	1360693
Xylene (Total)	mg/kg	ND	ND	ND	0.05	1360693
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	3	1360693
>C10-C21 Hydrocarbons	mg/kg	ND	ND	1800	15	1362106
>C21-<C32 Hydrocarbons	mg/kg	ND	27	640	15	1362106
Modified TPH (Tier1)	mg/kg	ND	27	2400	20	1358549
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	108	113	105		1362106
Isobutylbenzene - Volatile	%	99	107	95		1360693
n-Dotriacontane - Extractable	%	94	100 (1)	91 (2)		1362106

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) No resemblance to petroleum products in lube oil range.
(2) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Job #: A799260
Report Date: 2007/11/30

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		U62916	U62919		
Sampling Date		2007/09/07	2007/09/07		
COC Number		12116	12116		
Registration #					
	Units	RM-JW07-TP4-BS3	RM-JW07-TP5-BS3	RDL	QC Batch

TPH COMPOUNDS					
Benzene	mg/kg	ND	ND	0.03	1360693
Toluene	mg/kg	ND	ND	0.03	1360693
Ethylbenzene	mg/kg	ND	ND	0.03	1360693
Xylene (Total)	mg/kg	ND	ND	0.05	1360693
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	1360693
>C10-C21 Hydrocarbons	mg/kg	78	26	15	1362106
>C21-<C32 Hydrocarbons	mg/kg	280	ND	15	1362106
Modified TPH (Tier1)	mg/kg	350	26	20	1358549
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	102	106		1362106
isobutylbenzene - Volatile	%	105	105		1360693
n-Dotriacontane - Extractable	%	97 (1)	102 (2)		1362106
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Fuel oil fraction. Lube oil fraction. (2) Fuel oil fraction.					

Maxxam Job #: A799260
Report Date: 2007/11/30

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		U62920		U62921		
Sampling Date		2007/09/07		2007/09/07		
COC Number		12116		12116		
Registration #						
	Units	RM-JW07-TP6-BS4	RDL	RM-JW07-TP7-BS1	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/kg	ND	0.03	ND	0.03	1360693
Toluene	mg/kg	ND	0.03	ND	0.03	1360693
Ethylbenzene	mg/kg	2.5	0.03	ND	0.03	1360693
Xylene (Total)	mg/kg	3.2	0.05	ND	0.05	1360693
C6 - C10 (less BTEX)	mg/kg	1400	30	4	3	1360693
>C10-C21 Hydrocarbons	mg/kg	7000	15	310	15	1362106
>C21-<C32 Hydrocarbons	mg/kg	150	15	300	15	1362106
Modified TPH (Tier1)	mg/kg	8600	30	620	20	1358549
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	65		96		1362106
Isobutylbenzene - Volatile	%	105		104		1360693
n-Dotriacontane - Extractable	%	91 (1)		89 (1)		1362106

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Fuel oil fraction. Lube oil fraction.

Maxxam Job #: A7A2043
Report Date: 2007/09/26

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: PHASE III ESA, BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75241	U75241	U75243		
Sampling Date		2007/09/19	2007/09/19	2007/09/19		
COC Number		12151	12151	12151		
Registration #						
	Units	RMJW07-MW1-SS4	RMJW07-MW1-SS4 Lab-Dup	RMJW07-MW2-SS3	RDL	QC Batch

INORGANICS						
Moisture	%	14		7	1	1364119
TPH COMPOUNDS						
Benzene	mg/kg	ND		ND	0.03	1364122
Toluene	mg/kg	ND		ND	0.03	1364122
Ethylbenzene	mg/kg	ND		ND	0.03	1364122
Xylene (Total)	mg/kg	ND		ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND		260	3	1364122
>C10-C21 Hydrocarbons	mg/kg	ND	ND	2200	15	1366733
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	97	15	1366733
Modified TPH (Tier1)	mg/kg	ND		2500	20	1363484
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	98	96	116		1366733
Isobutylbenzene - Volatile	%	102		206 (1)		1364122
n-Dotriacontane - Extractable	%	109	105	127 (2)		1366733

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Isobutylbenzene recovery not within acceptance limits due to matrix/co-extractive interference.
(2) Weathered fuel oil fraction.

Maxxam Job #: A7A2043
Report Date: 2007/09/26

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: PHASE III ESA, BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75244	U75245		
Sampling Date		2007/09/19	2007/09/19		
COC Number		12151	12151		
Registration #					
	Units	RMJW07-MW3-SS2	RMJW07-MW4-SS1	RDL	QC Batch

INORGANICS					
Moisture	%	20	12	1	1364119
TPH COMPOUNDS					
Benzene	mg/kg	ND	ND	0.03	1364122
Toluene	mg/kg	ND	ND	0.03	1364122
Ethylbenzene	mg/kg	ND	ND	0.03	1364122
Xylene (Total)	mg/kg	ND	ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	1364122
>C10-C21 Hydrocarbons	mg/kg	200	65	15	1366733
>C21-<C32 Hydrocarbons	mg/kg	2800	550	15	1366733
Modified TPH (Tier1)	mg/kg	3000	610	20	1363484
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	95	101		1366733
Isobutylbenzene - Volatile	%	109	124		1364122
n-Dotriacontane - Extractable	%	80 (1)	110 (1)		1366733
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Lube oil fraction.					

Maxxam Job #: A7A2029
Report Date: 2007/09/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75180	U75184	U75185		
Sampling Date		2007/09/19	2007/09/19	2007/09/19		
COC Number		12152	12152	12152		
Registration #						
	Units	RMJW07-MW8-SS1	RMJW07-MW9-SS4	DUPLICATE #1	RDL	QC Batch

INORGANICS						
Moisture	%	10	7	18	1	1364119
TPH COMPOUNDS						
Benzene	mg/kg	ND	ND	ND	0.03	1364122
Toluene	mg/kg	ND	ND	ND	0.03	1364122
Ethylbenzene	mg/kg	ND	ND	ND	0.03	1364122
Xylene (Total)	mg/kg	ND	ND	ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	3	1364122
>C10-C21 Hydrocarbons	mg/kg	ND	ND	49	15	1365188
>C21-<C32 Hydrocarbons	mg/kg	31	25	76	15	1365188
Modified TPH (Tier1)	mg/kg	31	25	130	20	1363484
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	95	94	96		1365188
Isobutylbenzene - Volatile	%	123	108	130		1364122
n-Dotriacontane - Extractable	%	105 (1)	105 (1)	104 (2)		1365188

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Lube oil range.
(2) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Job #: A7A2029
Report Date: 2007/09/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75186	U75187		
Sampling Date		2007/09/19	2007/09/19		
COC Number		12152	12152		
Registration #					
	Units	DUPLICATE #2	DUPLICATE #4	RDL	QC Batch

INORGANICS					
Moisture	%	12	9	1	1364119
TPH COMPOUNDS					
Benzene	mg/kg	ND	ND	0.03	1364122
Toluene	mg/kg	ND	ND	0.03	1364122
Ethylbenzene	mg/kg	ND	ND	0.03	1364122
Xylene (Total)	mg/kg	ND	ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	1364122
>C10-C21 Hydrocarbons	mg/kg	ND	ND	15	1365188
>C21-<C32 Hydrocarbons	mg/kg	ND	43	15	1365188
Modified TPH (Tier1)	mg/kg	ND	43	20	1363484
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	96	96		1365188
Isobutylbenzene - Volatile	%	115	125		1364122
n-Dotriacontane - Extractable	%	102	106 (1)		1365188

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Lube oil range.

Maxxam Job #: A7A0059
Report Date: 2007/09/20

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: PHASE III ESA, BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U66201	U66201	U66222		
Sampling Date		2007/09/10	2007/09/10	2007/09/10		
COC Number		12120	12120	12120		
Registration #						
	Units	RM-JW07-TP7-BS4	RM-JW07-TP7-BS4 Lab-Dup	BVM-JW07-TP21-BS4	RDL	QC Batch

INORGANICS						
Moisture	%	25	29	23	1	1360980
TPH COMPOUNDS						
Benzene	mg/kg	ND	ND	ND	0.03	1360981
Toluene	mg/kg	0.04	ND	ND	0.03	1360981
Ethylbenzene	mg/kg	18	16	ND	0.03	1360981
Xylene (Total)	mg/kg	27	25	ND	0.05	1360981
C6 - C10 (less BTEX)	mg/kg	1800	1700	ND	3	1360981
>C10-C21 Hydrocarbons	mg/kg	25000	23000	ND	15	1360985
>C21-<C32 Hydrocarbons	mg/kg	430	410	65	15	1360985
Modified TPH (Tier1)	mg/kg	27000		65	20	1360309
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	384 (1)	366 (1)	94		1360985
Isobutylbenzene - Volatile	%	138	159 (2)	103		1360981
n-Dotriacontane - Extractable	%	128 (3)	122 (3)	105 (4)		1360985

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) Please refer to General Comments page for specific clarification.

(2) Isobutylbenzene recovery not within acceptance limits due to matrix/co-extractive interference.

(3) Weathered fuel oil fraction. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sample dilution.

(4) Lube oil fraction.

Maxxam Job #: A799260
Report Date: 2007/11/30

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		U62742	U62742	U62914		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP1-BS2	RM-JW07-TP1-BS2 Lab-Dup	RM-JW07-TP2-BS1	RDL	QC Batch

PCBs						
Total PCB	ug/g	0.11	0.14	ND	0.05	1360977
Surrogate Recovery (%)						
Decachlorobiphenyl	%	126 (1)	126	107		1360977
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Aroclor 1260.						

Maxxam ID		U62915	U62961	U62972		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP3-BS4	RP-JW07-TP6-BS1	RP-JW07-TP7-BS1	RDL	QC Batch

PCBs						
Total PCB	ug/g	ND	ND	ND	0.05	1360977
Surrogate Recovery (%)						
Decachlorobiphenyl	%	107	100	100		1360977
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam Job #: A7D3849
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name:
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		W19384		
Sampling Date		2007/12/03		
COC Number		N/A		
Registration #				
	Units	RM-JW07-TP9-BS1	RDL	QC Batch

PCBs				
Total PCB	ug/g	ND	1	1418848
Surrogate Recovery (%)				
Decachlorobiphenyl	%	95 (1)		1418848

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated PCB RDL due to matrix / co-extractive interference.

Maxxam Job #: A734197
Report Date: 2007/09/19



Maxxam Analytics
Client Project #: A799260
Project name:
Sampler Initials:

CONVENTIONAL PARAMETERS(SOIL)

MaxxamID		C98747	C98748		
SamplingDate		2007/09/07	2007/09/07		
	Units	U62920-02R/RM-JW07-TP6-BS4	U62935-01R/RM-JW07-TP8-BS1	RDL	QC Batch
% Moisture	%	18	16	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	17	21	5	451895
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

MaxxamID		C98749	C98750		
SamplingDate		2007/09/07	2007/09/07		
	Units	U62942-01R/RP-JW07-TP1-BS1	U62943-01R/RP-JW07-TP2-BS1	RDL	QC Batch
% Moisture	%	9	15	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	2.3	7.1	0.5	451895
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

MaxxamID		C98751	C98752		
SamplingDate		2007/09/07	2007/09/07		
	Units	U62944-01R/RP-JW07-TP3-BS2	U62945-01R/RP-JW07-TP4-BS1	RDL	QC Batch
% Moisture	%	11	23	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	4.1	<0.5	0.5	451895
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Validated by : 

 DELIA BARBUL

Maxxam Job #: A735438
Report Date: 2007/12/04

Maxxam Analytics
Client Project #: A7A3137
Project name:
Sampler Initials:

CONVENTIONAL PARAMETERS (SOIL)

Maxxam ID		D04909		
Sampling Date		2007/09/19		
	Units	U80011-01R\RPJW07-MW1-SS1	RDL	QC Batch
% Moisture	%	21	N/A	N/A
CONVENTIONALS				
Total Cyanide (CN)	mg/kg	22	3	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam ID		D04910	D04911		
Sampling Date		2007/09/19	2007/09/19		
	Units	U80016-01R\RMJW07-MW5-SS1	U80017-01R\RMJW07-MW6-SS3	RDL	QC Batch
% Moisture	%	15	20	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	8.9	<0.5	0.5	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		D04912	D04913		
Sampling Date		2007/09/19	2007/09/19		
	Units	U80018-01R\RMJW07-MW7-SS1	U80019-01R\DUPLICATE#3	RDL	QC Batch
% Moisture	%	5	12	N/A	N/A
CONVENTIONALS					
Total Cyanide (CN)	mg/kg	1.3	<0.5	0.5	453951
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A747658
Report Date: 2007/12/05

Maxxam Analytics
Client Project #: A7D3849
Project name:
Sampler Initials:

CONVENTIONAL PARAMETERS (SOIL)

Maxxam ID		D62929		
Sampling Date		2007/12/03		
	Units	W19359-01R/RM-JW07-TP7-BS2	RDL	QC Batch

% Moisture	%	18	N/A	N/A
CONVENTIONALS				
Total Cyanide (CN)	mg/kg	8	1	473732

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7A5830
Report Date: 2007/10/03

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		U92352	U92443	U92444		
Sampling Date		2007/09/20	2007/09/20	2007/09/20		
COC Number		15298	15298	15298		
Registration #						
	Units	RM-JW07-MW7	RM-JW07-MW8	RM-JW07-MW9	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/L	0.002	ND	0.003	0.001	1371509
Toluene	mg/L	0.001	0.007	0.003	0.001	1371509
Ethylbenzene	mg/L	0.047	0.035	0.064	0.001	1371509
Xylene (Total)	mg/L	0.060	0.12	0.091	0.002	1371509
C6 - C10 (less BTEX)	mg/L	0.67	0.69	0.66	0.01	1371509
>C10-C21 Hydrocarbons	mg/L	5.0	1.3	4.8	0.05	1371295
>C21-<C32 Hydrocarbons	mg/L	0.5	0.2	9.0	0.1	1371295
Modified TPH (Tier1)	mg/L	6.2	2.2	14	0.1	1369894
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	79	74	77		1371295
Isobutylbenzene - Volatile	%	114	105	104		1371509
n-Dotriacontane - Extractable	%	99 (1)	87 (2)	129 (3)		1371295

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Fuel oil fraction.
(2) No resemblance to petroleum products in fuel oil /lube oil range.
(3) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Job #: A7A5830
Report Date: 2007/10/03

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		U92452	U92453		U92454		
Sampling Date		2007/09/20	2007/09/20		2007/09/20		
COC Number		15297	15297		15297		
Registration #							
	Units	RM-JW07-MW1	RM-JW07-MW2	QC Batch	RM-JW07-MW3	RDL	QC Batch

TPH COMPOUNDS							
Benzene	mg/L	ND	ND	1371509	ND	0.001	1371509
Toluene	mg/L	0.002	0.004	1371509	0.005	0.001	1371509
Ethylbenzene	mg/L	ND	0.005	1371509	ND	0.001	1371509
Xylene (Total)	mg/L	0.004	0.004	1371509	0.006	0.002	1371509
C6 - C10 (less BTEX)	mg/L	ND	0.11	1371509	ND	0.01	1371509
>C10-C21 Hydrocarbons	mg/L	0.12	15	1371295	0.40	0.05	1371295
>C21-<C32 Hydrocarbons	mg/L	0.2	1.1	1371295	2.3	0.1	1371295
Modified TPH (Tier1)	mg/L	0.3	16	1369894	2.7	0.1	1370585
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	72	82	1371295	74		1371295
Isobutylbenzene - Volatile	%	102	81	1371509	89		1371509
n-Dotriacontane - Extractable	%	81 (1)	80 (2)	1371295	83 (3)		1371295

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Fuel oil range. Lube oil range.
(2) Weathered fuel oil fraction.
(3) Lube oil fraction.

Maxxam Job #: A7A5830
Report Date: 2007/10/03

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		U92455	U92456	U92457		
Sampling Date		2007/09/20	2007/09/20	2007/09/20		
COC Number		15297	15299	15299		
Registration #						
	Units	RM-JW07-MW4	BVM-JW07-MW9	BVM-JW07-TP10	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/L	ND	ND	ND	0.001	1371509
Toluene	mg/L	0.002	ND	ND	0.001	1371509
Ethylbenzene	mg/L	ND	ND	ND	0.001	1371509
Xylene (Total)	mg/L	0.002	ND	ND	0.002	1371509
C6 - C10 (less BTEX)	mg/L	ND	ND	ND	0.01	1371509
>C10-C21 Hydrocarbons	mg/L	0.17	0.18	0.19	0.05	1371295
>C21-<C32 Hydrocarbons	mg/L	0.5	0.2	0.1	0.1	1371295
Modified TPH (Tier1)	mg/L	0.6	0.4	0.3	0.1	1370585
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	74	83	79		1371295
Isobutylbenzene - Volatile	%	92	96	95		1371509
n-Dotriacontane - Extractable	%	92 (1)	90 (1)	90 (1)		1371295
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) Fuel oil range. Lube oil range.						

Maxxam Job #: A7C0154
Report Date: 2007/11/05

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

RESULTS OF ANALYSES OF WATER

Maxxam ID		V57564	V57577	V57578		
Sampling Date		2007/10/22	2007/10/22	2007/10/22		
COC Number		15304	15304	15304		
Registration #						
	Units	RPJW07-MW1	RMJW07-MW5	RMJW07-MW6	RDL	QC Batch

INORGANICS						
Strong Acid Dissoc. Cyanide (CN)	mg/L	ND	0.010	0.018	0.002	1397187
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V57579		
Sampling Date		2007/10/22		
COC Number		15304		
Registration #				
	Units	RMJW07-MW7	RDL	QC Batch

INORGANICS				
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.072	0.002	1397187
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: A7C0154
Report Date: 2007/11/05

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

GENERAL COMMENTS

Sample V57564-01: The sample was decanted for Cyanide due to turbidity.

Sample V57577-01: The sample was decanted for Cyanide due to turbidity.

Sample V57578-01: The sample was decanted for Cyanide due to turbidity.

Sample V57579-01: The sample was decanted for Cyanide due to turbidity.

Results relate only to the items tested.

APPENDIX 5e

GPS Coordinates – Rambler Main Mine Area

GPS Coordinates - NAD83 - Rambler Main Mine

Location	Northing	Easting
RM-JW07-TP3	565987	5527314
RM-JW07-TP4	566059	5527469
RM-JW07-TP5	566034	5527499
RM-JW07-TP6	565992	5527427
RM-JW07-TP7	566000	5527420
RM-JW07-TP8	565985	5527476
RM-JW07-TP9	565906	5527316
RM-JW07-MW3	566040	5527469
RM-JW07-MW4	566044	5527487
RM-JW07-MW5	566014	5527498
RM-JW07-MW6	565978	5527486
RM-JW07-MW7	565991	5527447
RM-JW07-MW8	566011	5527396
RM-JW07-MW9	565982	5527435

APPENDIX 5f

Results of Hydraulic Response (Baildown) Test – Rambler Main Mine Area

**Jacques Whitford**

607 Torbay Road
St. John's, NL
Phone: +1 709-576-1458

Slug Test Data Report

Project: Phase III ESA, Former Rambler Mine - Main

Number: 1028976

Client: NL DNR-MD

Page 1

Test Well: RM-MW7**Slug Test:** RM-MW7

Test Well: RM-MW7

Depth to Static WL: 1.78 [m]

Casing radius: 0.025 [m]

Location: Baie Verte, NL

Boring radius: 0.05 [m]

Recorded by: C. Anstey-Moore

Screen length: 2.46 [m]

Date: 12/5/2007

Aquifer Thickness: 1.26 [m]

	Time [s]	Depth to WL [m]	Drawdown [m]
1	0	2.40	0.62
2	5	2.32	0.54
3	10	2.26	0.48
4	15	2.21	0.43
5	20	2.14	0.36
6	25	2.09	0.31
7	30	2.03	0.25
8	35	1.98	0.20
9	40	1.92	0.14
10	45	1.86	0.08
11	60	1.80	0.02



Jacques Whitford

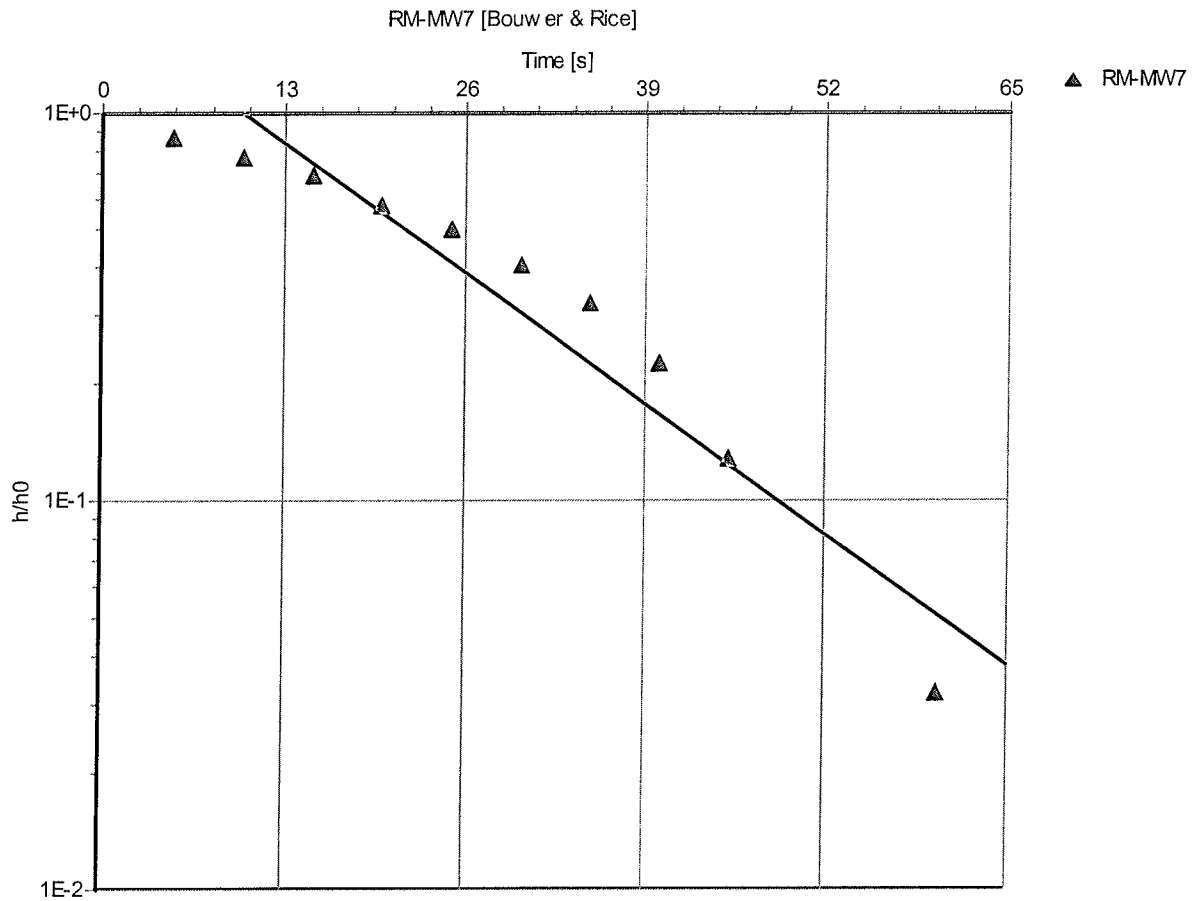
607 Torbay Road
St. John's, NL
Phone: +1 709-576-1458

Slug Test Analysis Report

Project: Phase III ESA, Former Rambler Mine - Main

Number: 1028976

Client: NL DNR-MD



Slug Test: RM-MW7

Analysis Method: Bouwer & Rice

Analysis Results:

Conductivity: 3.37E-5 [m/s]

Test parameters:

Test Well:	RM-MW7	Aquifer Thickness:	1.26 [m]
Casing radius:	0.025 [m]	Gravel Pack Porosity (%):	25
Screen length:	2.46 [m]		
Boring radius:	0.05 [m]		
r(eff):	0.033 [m]		

Comments: Water level within screened interval during baildown test, effective radius calculated.

Evaluated by: C. Ansley-Moore

Evaluation Date: 12/5/2007



Jacques Whitford

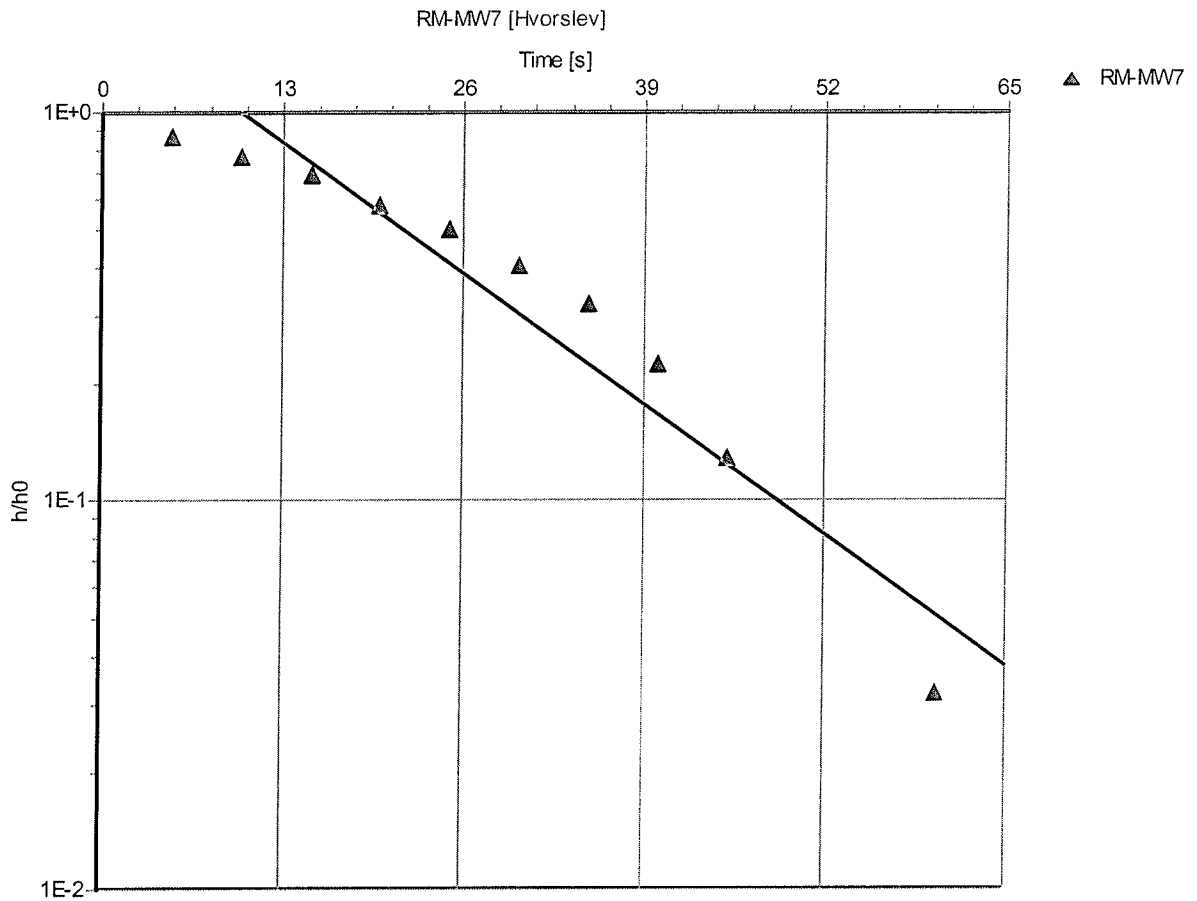
607 Torbay Road
 St. John's, NL
 Phone: +1 709-576-1458

Slug Test Analysis Report

Project: Phase III ESA, Former Rambler Mine - Main

Number: 1028976

Client: NL DNR-MD



Slug Test: **RM-MW7**

Analysis Method: **Hvorslev**

Analysis Results: Conductivity: 2.96E-5 [m/s]

Test parameters: Test Well: RM-MW7 Aquifer Thickness: 1.26 [m]
 Casing radius: 0.025 [m]
 Screen length: 2.46 [m]
 Boring radius: 0.05 [m]

Comments:

Evaluated by: C. Anstey-Moore

Evaluation Date: 12/5/2007

APPENDIX 6a

Site Drawings – Bunkhouse Area



LEGEND

	TEST PIT (CURRENT INVESTIGATION)
	MONITOR WELL (CURRENT INVESTIGATION)
	FORMER TEST PIT LOCATION (AMEC, 2007)

NOTES:
 1. DRAWING BASED ON 1999 AERIAL PHOTOGRAPHY.
 2. FORMER SAMPLING LOCATIONS AND SITE FEATURES / INFRASTRUCTURE APPROXIMATE AND BASED ON INFORMATION PROVIDED ON DRAWINGS IN PHASE II ESA REPORT.
 3. © JACQUES WHITFORD, 2007.

CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ENVIRONMENTAL SITE
 ASSESSMENT, FORMER CONSOLIDATED
 RAMBLER MINE, BAIE VERTE, NL**

DRAWING TITLE:
**SITE AND PHASE III ESA
 SAMPLE LOCATION PLAN
 BUNKHOUSE AREA**

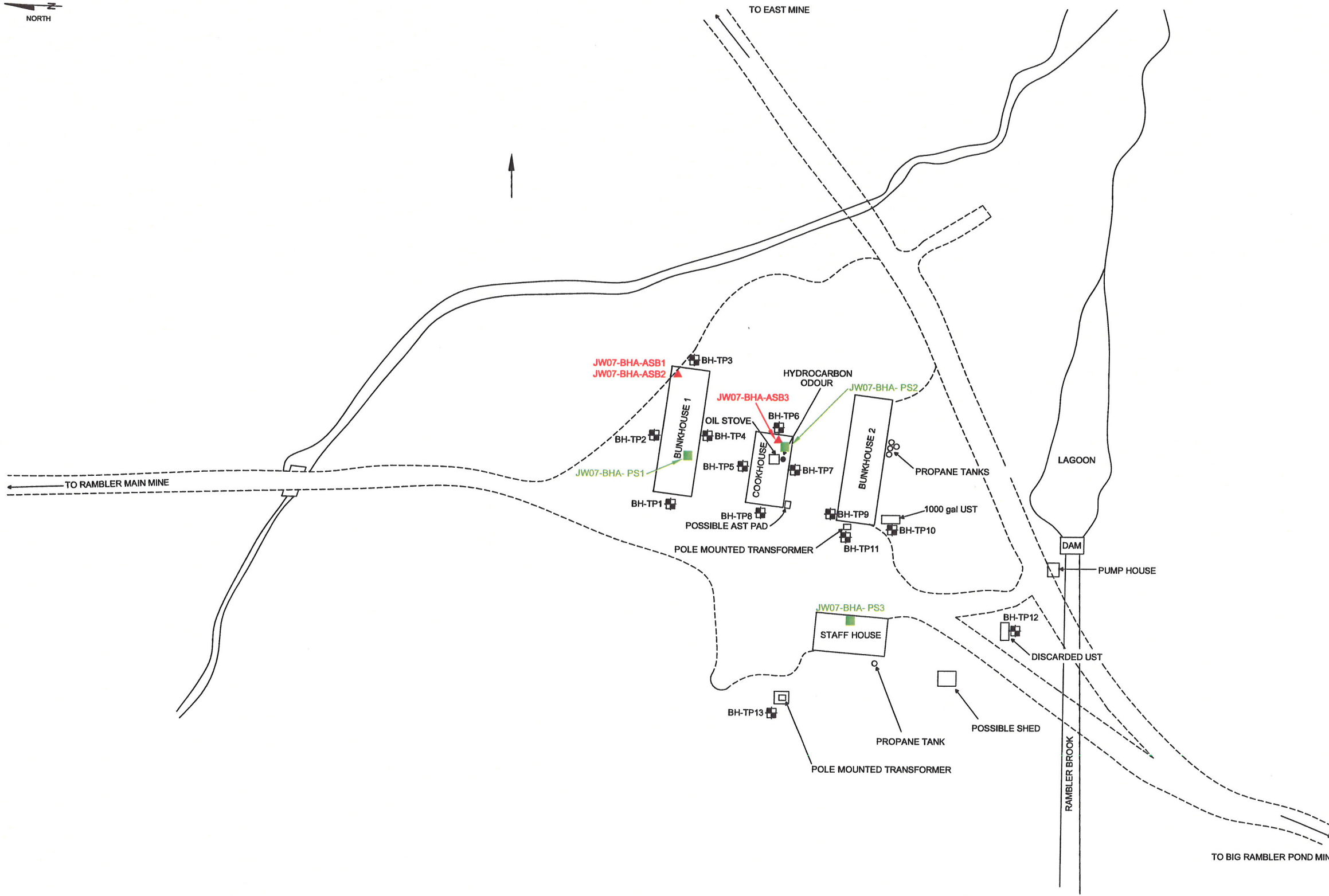
**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	1:1000	DATE:	DEC. 13, 2007
DRAWN BY:	N.M.	CHECKED BY:	
EDITED BY:	-	REV. No:	0
DRAWING No:	1028976-EE-12		
CAD FILE:	1028976-EE-07.DWG		





NORTH



LEGEND

- GRAVEL ACCESS ROADS
- STREAM / WATER BODY
- GROUNDWATER FLOW DIRECTION
- TEST PIT LOCATION (AMEC 2007)
- ▲ ASBESTOS SAMPLE (JW 2007)
- PAINT SAMPLE (JW 2007)

NOTES:
 1. DRAWING BASED ON INFORMATION PROVIDED BY CLIENT & JW FIELD NOTES.
 2. DO NOT SCALE FROM DRAWING.
 3. © JACQUES WHITFORD, 2007.

CLIENT:
**NEWFOUNDLAND AND LABRADOR
 DEPARTMENT OF NATURAL RESOURCES**

PROJECT TITLE:
**PHASE III ESA & HAZARDOUS
 MATERIALS ASSESSMENT
 FORMER CONSOLIDATED RAMBLER MINE
 BUNK HOUSE AREA, BAIE VERTE, NL**

DRAWING TITLE:
**HAZARDOUS MATERIALS ASSESSMENT
 SAMPLE LOCATION PLAN
 BUNKHOUSE AREA**

**Jacques Whitford
 CONSULTING ENGINEERS**

SCALE:	NTS	DATE:	DEC. 12, 2007
DRAWN BY:	S.N.	CHECKED BY:	
EDITED BY:	-	REV. No:	0
DRAWING No:	1028976-EE-13		
GAD FILE:	1028976-EE-19.DWG		



APPENDIX 6b

Test Pit & Monitor Well Records
& Symbols and Terms – Bunkhouse Area

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology Describing Common Soil Genesis

<i>Rootmat</i>	-	vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	-	mixture of soil and humus capable of supporting good vegetative growth
<i>Peat</i>	-	fibrous aggregate of visible and invisible fragments of decayed organic matter
<i>Loam</i>	-	silty sand or sand with silt mixed with organics matter
<i>Till</i>	-	unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	-	any materials below the surface identified as placed by humans (excluding buried services)

Terminology Describing Soil Structure

<i>Homogeneous</i>	-	same colour and appearance throughout
<i>Stratified</i>	-	composed of alternating successions of different soil types, e.g., silt and sand
<i>Lensed</i>	-	inclusion of small pockets of different soils
<i>Laminated</i>	-	alternating layers of varying material or colour with the layers less than 6 mm thick
<i>Layer</i>	-	thickness > 75 mm
<i>Seam</i>	-	thickness between 2 mm and 75 mm
<i>Parting</i>	-	thickness < 2 mm

Grain Size and Plasticity

Terminology describing soils on the basis of grain size and plasticity is based on the Unified Soil Classification System (USCS) (ASTM D-2487). The classification excludes particles larger than 76 mm (3 inches). This system provides a group symbol (e.g., SM) and group name (e.g., silty SAND) for identification. Note: terminology describing materials in the absence of laboratory analysis is based on the ASTM D-2488 visual method.

Terminology describing materials outside the USCS (e.g., particles larger than 76 mm, visible organic matter, construction debris) is based on the (visually estimated) proportion of these materials present:

<i>Trace, or occasional</i>	Less than approximately 10%
<i>Some</i>	approximately 10-20%
<i>Frequent</i>	Greater than approximately 20%

Standard Penetration Test 'N-Value'

The performance of the Standard Penetration Test provides an 'N-value'; the number of blows of a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (51 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration is achieved and 'N' values cannot be determined, the number of blows is reported over sampler penetration in millimetres (e.g., 50/75).

Density of Cohesionless Soils

The standard terminology to describe cohesionless soils includes the compactness (formerly "relative density"), as determined by laboratory test or by the Standard Penetration Test 'N- value'.

Density	N-Value	Compactness %
<i>Very Loose</i>	< 4	< 15
<i>Loose</i>	4-10	15-35
<i>Compact</i>	10-30	35-65
<i>Dense</i>	30-50	65-85
<i>Very Dense</i>	> 50	> 85

Consistency of Cohesive Soils

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		N-Value
	ksf	kPa	
<i>Very Soft</i>	< 0.25	< 12.5	< 2
<i>Soft</i>	0.25-0.5	12.5-25	2-4
<i>Firm</i>	0.5-1.0	25-50	4-8
<i>Stiff</i>	1.0-2.0	50-100	8-15
<i>Very Stiff</i>	2.0-4.0	100-200	15-30
<i>Hard</i>	> 4.0	> 200	> 30

ROCK DESCRIPTION

Rock Quality Designation (RQD)

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be applied to NW core; however, it can be used on different core sizes if most of the fractures caused by drilling stresses are easily distinguishable from *in situ* fractures.

RQD (%)	Rock Quality
90-100	Excellent - intact, very sound
75-90	Good - moderately jointed, massive, sound
50-75	Fair - fractured, blocky and seamy
25-50	Poor - severely fractured, shattered and very seamy or blocky
0-25	Very poor - very severely fractured, crushed

Total Core Recovery (TCR)

Total core recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

Weathering State

Term	Description
Slight	Weathering limited to the surface of major discontinuities. Typically iron stained.
Moderate	Weathering extends throughout rock mass. Rock is not friable.
High	Weathering extends throughout rock mass. Rock is friable (crumbles naturally or broken between fingers).

Terminology Describing Rock Mass

Spacing (mm)	Bedding, Laminations, Bands	Discontinuity
2000-6000	Very Thick	Very wide
600-2000	Thick	Wide
200-600	Medium	Moderately close
60-200	Thin	Close
20-60	Very Thin	Very close
< 20	Laminated	Extremely close
< 6	Thinly Laminated	

RECORD SYMBOLS AND ABBREVIATIONS

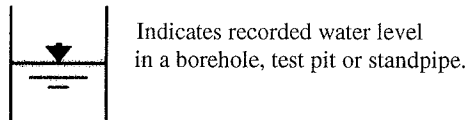
Sample Types

SS	Split spoon sample (obtained by performing the Standard Penetration Test)	WS	Wash sample	ST	Shelby tube or thin wall tube
		BS	Bulk sample	HQ, NQ, BQ, etc.	Rock core samples obtained using standard size diamond drilling bits.
		RC	Rock chip sample		

Laboratory Tests

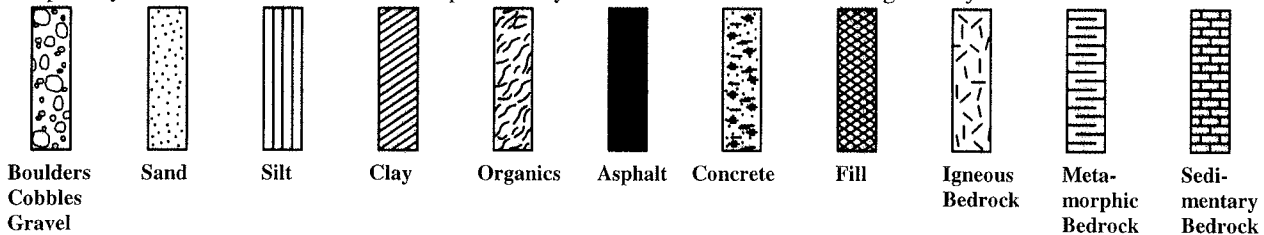
S	Sieve analysis	H	Hydrometer analysis	A	Atterberg limits
---	----------------	---	---------------------	---	------------------

Water Level Measurement



Strata Plot

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

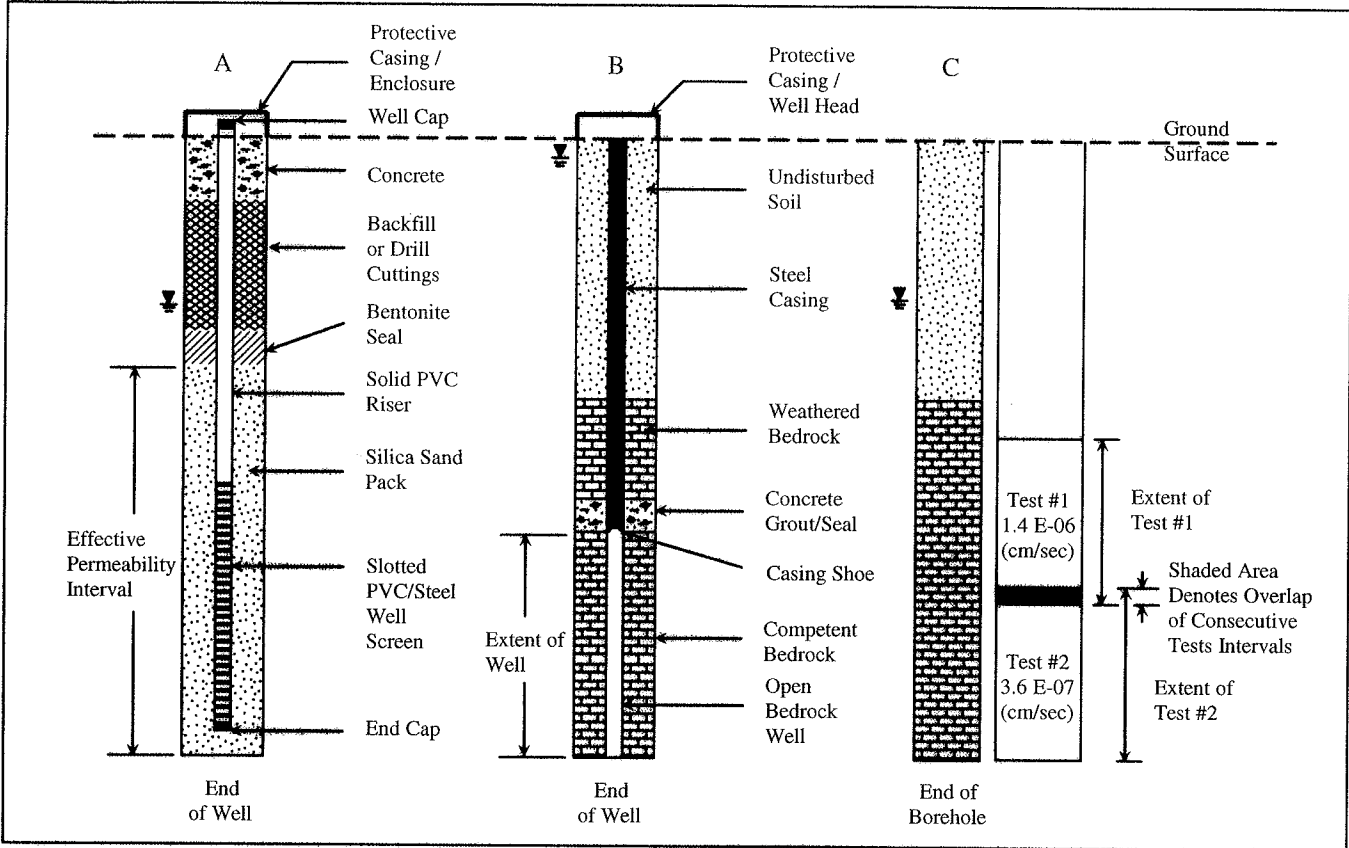


Solid lines between strata indicate the boundary between different strata. Dashed lines between strata indicate the boundary between strata is inferred.

SYMBOLS AND TERMS USED ON MONITOR WELL, WATER WELL AND ENVIRONMENTAL RECORDS

Well Construction and Permeability Testing

Basic symbols used in typical monitor or water well and piezometer construction are shown below. The well construction symbols or materials shown below may be combined or altered to suit a particular application. The diagram shows: A) a typical piezometer or monitor well in overburden; B) a typical water well in bedrock; C) borehole permeability test results in bedrock.



Apparent Moisture Content

Terminology used to describe apparent moisture content at the time of borehole drilling or test pit excavation.

Symbol	Description
D	Dry – containing little or no moisture
M	Moist – containing some moisture without having 'free' moisture
S	Saturated – 'free' moisture can drain from material

Terminology Describing Contamination

PID	-	Photo Ionization Detector (readings in ppm)
TPH	-	Total Petroleum Hydrocarbon concentration (readings in ppm based on mass)
ppm	-	Parts Per Million (measurement of concentration, mg/kg or mg/L)
nd	-	Not Detected – below limit of quantification (LOQ)

Apparent Hydrocarbon Odour

Terminology used to describe apparent hydrocarbon odour at the time of borehole drilling or test pit excavation.


Value	Description
0	No apparent odour
1	Slight odour
2	Moderate odour
3	Strong odour

JACQUES WHITFORD

TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment
 LOCATION Former Consolidated Rambler Mine - Bunkhouse Area
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A

TEST PIT No. RMJW07-TP1
 PROJECT No. 1028976
 DATUM _____



DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Loose, brown-grey sandy loam with occasional cobbles												
				BS	1	-		1.2	-	-	-	-	-	-
				BS	2	-		6.8	nd	nd	nd	nd	nd	nd
1														
		End of Test Pit												
		Groundwater not encountered.												
		Bedrock encountered at ~ 1.2 m depth.												
2														
3														
4														
5														



TEST PIT RECORD

CLIENT Newfoundland and Labrador Department of Natural Resources
 PROJECT Phase III ESA & Hazardous Materials Assessment
 LOCATION Former Consolidated Rambler Mine - Bunkhouse Area
 DATES (mm-dd-yy): DUG 9-5-07 WATER LEVEL N/A

TEST PIT No. RMJW07-TP2
 PROJECT No. 1028976
 DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				PID READINGS (ppm)	CHEMICAL ANALYSIS (ppm)				
					TYPE	NUMBER	HYDROCARBON ODOUR	OTHER TESTS		TPH	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
0		Brown sandy loam with some cobbles			BS	1	-		4.7	27	nd	nd	nd	nd
		Severely fractured BEDROCK: mafic volcanic			BS	2	-		1.2	-	-	-	-	-
		End of Test Pit												
		Groundwater not encountered.												
		Bedrock encountered at 0.2 m depth.												
1														
2														
3														
4														
5														



CLIENT Newfoundland and Labrador Department of Natural Resources

PROJECT No. 1028976

PROJECT Phase III ESA & Hazardous Materials Assessment

DRILLING METHOD Dia

LOCATION Former Consolidated Rambler Mine - Bunkhouse Area

SIZE HQ

DATES (mm-dd-yy): BORING 9-15-07

WATER LEVEL 1.79 m 9-20-07

DATUM _____

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES				HYDROCARBON ODOUR	APPARENT MOISTURE CONTENT	PID (ppm)	TPH (ppm)	WELL CONSTRUCTION DETAILS
					TYPE	NUMBER	RECOVERY	N-VALUE OR RQD %					
0		Compact, brown SAND with silt and gravel (SP-SM)				mm							CAST IRON WELL HEAD
		Very dense, grey GRAVEL with silt and sand (GP-GM)		SS	1	150	11	-	D	3.6	-		BACKFILL
1		Compact, brown SAND with silt and gravel (SP-SM)		SS	2	350	55	-	D	4.1	-		BENTONITE
		Fractured BEDROCK: Greyish green mafic volcanics		SS	3	450	28	-	D	4.9	-		
2		BEDROCK: Greyish green mafic volcanics		SS	4	425	78/430	-	D	17.2	nd		
				RC	5	1500	63%	-	-	-	-		
3			RC	6	725	83%	-	-	-	-			
4		End of Borehole											END CAP
5													



APPENDIX 6c

Laboratory Analytical Results Summary Tables – Bunkhouse Area
(Current Investigation & AMEC, 2007)

Table 6.1 Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil - Bunkhouse Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Bunkhouse Area
Baie Verte, NL
JW Project No. 1028976

Parameters	Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10 (Gas Range)	C10-C21 (Fuel Range)	C21-C32 (Lube Range)	Modified TPH - Tier 1 ³	Resemblance
RDL	0.03	0.03	0.03	0.05	3	15	15	20	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Criteria ¹	1.8	160	430	200	na	na	na	7,400	
Criteria ²	1.8	160	430	200	na	na	na	10,000	
RM-JW07-TP1-BS2	nd	nd	nd	nd	nd	nd	nd	nd	-
RM-JW07-TP2-BS1	nd	nd	nd	nd	nd	nd	27	27	NP
RM-JW07-MW1-SS4	nd	nd	nd	nd	nd	nd	nd	nd	-
RM-JW07-MW1-SS4 Lab-Dup	-	-	-	-	-	nd	nd	-	-
Duplicate #2	nd	nd	nd	nd	nd	nd	nd	nd	-
RM-JW07-MW2-SS3	nd	nd	nd	nd	260	2,200	97	2,500	WFO

Notes:

- 1 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for commercial site with non-potable groundwater, coarse-grained soil and fuel oil impacts
- 2 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for a commercial site with non-potable groundwater, coarse-grained soil and lube oil impacts
- 3 = Modified TPH - Tier I does not include BTEX
- RDL = Reportable detection limit
- nd = Not detected above standard RDL
- na = No applicable criteria
- Duplicate #2 = JW field QA/QC duplicate sample
- WFO = Weathered fuel oil; LO = Lube oil; NP = Non-Petrogenic
- "-" = Parameter not analyzed

**Table 6.2 Results of Laboratory Analysis of PCBs in Soil - Bunkhouse Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Bunkhouse Area
Baie Verte, NL
JW Project No. 1028976**

Parameter	Polychlorinated Biphenyls (PCBs)
RDL	0.05
Units	mg/kg
Criteria ¹	33
RM-JW07-TP1-BS2	0.11
RM-JW07-TP1-BS2 Lab-Dup	0.14
RM-JW07-TP2-BS1	nd

Notes:

1 = 2007 Canadian Soil Quality Guidelines for Industrial Site

RDL = Reportable detection limit

nd = Not detected above standard RDL

Lab-Dup = Laboratory Duplicate Sample

**Table 6.3 Results of Laboratory Analysis of Petroleum Hydrocarbons in Groundwater - Bunkhouse Area
Phase III ESA & Hazardous Materials Assessment
Former Consolidated Rambler Mine - Bunkhouse Area
Baie Verte, NL
JW Project No. 1028976**

Parameters	RDL	Units	Criteria ¹	RM-JW07- MW1	RM-JW07- MW2
Benzene	0.001	mg/L	6.9	nd	nd
Toluene	0.001	mg/L	20	0.002	0.004
Ethylbenzene	0.001	mg/L	20	nd	0.005
Xylenes	0.002	mg/L	20	0.004	0.004
C6-C10 (Gas Range)	0.01	mg/L	na	nd	0.11
C10-C21 (Fuel Range)	0.05	mg/L	na	0.12	15
C21-C32 (Lube Range)	0.1	mg/L	na	0.2	1.1
Modified TPH - Tier I ²	0.1	mg/L	20	0.3	16
Resemblance				FO, LO	WFO

Notes:

1 = Atlantic RBCA Tier I Risk-Based Screening Level (RBSL) for groundwater at a commercial site with non-potable groundwater and coarse-grained soil

2 = Modified TPH - Tier I does not include BTEX

RDL = Reportable detection limit

nd = Not detected above standard RDL

na = No applicable criteria

"-" = Parameter not analyzed

FO = Fuel oil; WFO = Weathered fuel oil; LO = Lube oil

Table 6.4 Results of Laboratory Analyses for Asbestos - Bunkhouse Area
Hazardous Materials Assessment
Former Consolidated Rambler Copper Mine, Baie Verte, NL
Jacques Whitford Project No. 1028976

Sample No.	Location	Sample Description	Sample Analysis Results	Visually Similar Material Locations	Material Condition & Quantities	
JW07-BHA-ASB1	Bunkhouse Area	Bunkhouse No. 1	Beige/brown floor covering	No asbestos concentration	Throughout building	N/A
JW07-BHA-ASB2		Bunkhouse No. 1	Drywall joint compound	No asbestos concentration	Throughout building	N/A
JW07-BHA-ASB3		Cookhouse	Drywall joint compound	No asbestos concentration	Throughout building	N/A
JW07-BHA-ASB6		-	Blind duplicate sample of JW07-BHA-ASB3	No asbestos concentration	-	-
JW07-BHA-ASB4		Cookhouse	Beige/brown floor covering	No asbestos concentration	Throughout building	N/A
JW07-BHA-ASB5		Staff House	Drywall joint compound	No asbestos concentration	Throughout building	N/A

Table 6.5 Results of Laboratory Analyses of Lead and Mercury in Paint - Bunkhouse Area
Hazardous Materials Assessment
Former Consolidated Rambler Copper Mine, Baie Verte, NL
Jacques Whittford Project No. 1028976

Parameters	Location	Description	Condition	Lead	Lead Leachability	Mercury	Mercury Leachability	Polychlorinated Biphenyls (PCBs)	
RDL				100	0.5	0.03	0.1	5	
Units				mg/kg	mg/L	mg/kg	mg/L	mg/kg	
Guideline¹				600	5	10	0.1	33	
JW07-BHA-PS1	Bunkhouse Area	Bunkhouse No. 1	Interior green on white paint on drywall	POOR	4,000	0.5	18	2.9	nd
JW07-BHA-PS2		Cookhouse	Interior white on pink/orange paint on drywall	POOR	1,900	nd	9.9	-	-
JW07-BHA-PS3		Staffhouse	Interior white on green paint on drywall	POOR	420	-	1.1	-	nd

Notes:

1. Guideline = NLDEC guideline for disposal of lead-based painted construction debris in an approved municipal landfill; Hazardous Products Act guideline for mercury in paint; Environment Canada Table of Metals Leachate Toxicity for lead and mercury leachability; CCME guideline for a commercial property for PCBs.
2. RDL = Reportable Detection Limit
3. "-" = No applicable guideline/value
4. Bold/Shaded = Value exceeds applicable criteria

Table 7-1: BTEX/TPH in Soil - Bunkhouse Area

AVERAGE SAMPLING DEPTH (m)	Lab ID	FIELD ID	DATE (D/M/Y)	MDL (mg/kg)	DATA				GUIDELINES			
					1.0 - 1.7 S2006-10889 BH-TP1-SS2 11-Sep-06 (mg/kg)	0 - 1.2 S2006-10890 BH-TP2-SS1 11-Sep-06 (mg/kg)	0 - 0.7 S2006-10891 BH-TP3-SS1 11-Sep-06 (mg/kg)	0 - 0.9 S2006-10892 BH-TP4-SS1 11-Sep-06 (mg/kg)	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES (mg/kg)	GASOLINE (mg/kg)	DIESEL/#2 (mg/kg)	#6 OIL (mg/kg)
	Lab Blank			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.8	1.8	1.8
	Benzene			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	1.8	1.8
	Toluene			0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.37	160	160
	Ethylbenzene			0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.082	430	430
	Total Xylenes			0.06	<0.06	<0.06	<0.06	<0.06	<0.06	11	200	200
	TPH (C6-C10)			10	<10	<10	<10	<10	<10	-	-	-
	TPH (>C10-C21)			10	<10 (<10)	22	<10	<10	<10	-	-	-
	TPH (>C21-C32)			50	<50 (<50)	<50	<50	<50	<50	-	-	-
	Modified TPH (C6-C32)			70	<70	<82	<70	<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

AVERAGE SAMPLING DEPTH (m)		DATA					GUIDELINES		
		0.9 - 1.5 S2006-10893 BH-TP5-SS2	0.9 - 1.5 S2006-10903 DUP B	0 - 0.7 S2006-10894 BH-TP6-SS1	0.2 - 1.2 S2006-10895 BH-TP7-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹		
Lab ID	FIELD ID	DATE (D/M/Y)	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	GASOLINE (mg/kg)	DIESEL#2 (mg/kg)	#6 OIL (mg/kg)
Benzene		11-Sep-06	<0.01	<0.01	<0.01	<0.01	1.8	1.8	1.8
Toluene			<0.01	<0.01	<0.01	<0.01	160	160	160
Ethylbenzene			0.03	<0.02	<0.02	<0.02	430	430	430
Total Xylenes			<0.06	<0.06	<0.06	<0.06	200	200	200
TPH (C6-C10)			10	282	<10	<10	-	-	-
TPH (>C10-C21)			10	2610	669	<10	-	-	-
TPH (>C21-C32)			50	<50	<50	<50	-	-	-
Modified TPH (C6-C32)			70	<3120	<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

AVERAGE SAMPLING DEPTH (m)	DATA				GUIDELINES				
	0 - 1.0 S2006-10896 BH-TP8-SS1	1.0 - 2.0 S2006-10897 DUP B	1.0 - 1.7 S2006-10898 BH-TP10-SS2	0 - 0.3 S2006-10900 BH-TP12-SS1	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL ¹			
DATE (D/M/Y)	11-Sep-06	11-Sep-06	11-Sep-06	11-Sep-06		GASOLINE (mg/kg)	DIESEL/#2 (mg/kg)	#6 OIL (mg/kg)	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)				
Benzene	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	0.37	160	160	160	
Ethylbenzene	0.02	<0.02	<0.02	<0.02	0.082	430	430	430	
Total Xylenes	0.06	<0.06	<0.06	<0.06	11	200	200	200	
TPH (C6-C10)	10	<10	<10	<10	-	-	-	-	
TPH (>C10-C21)	10	<10	25	<10	-	-	-	-	
TPH (>C21-C32)	50	<50	<50	<50	-	-	-	-	
Modified TPH (C6-C32)	70	<70	<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 7-6: PCBs in Soil - Bunkhouse Area

AVERAGE SAMPLING DEPTH (m)		DATA		GUIDELINES
LAB ID	0 - 0.3	0 - 0.3		
FIELD ID	S2006-10899	S2006-10901		1999 CCME RECOMMENDED
DATE (D/M/Y)	BH-TP11-SS1	BH-TP13-SS1		SOIL QUALITY GUIDELINES
PARAMETERS	11-Sep-06	11-Sep-06		INDUSTRIAL (REVISED 2005)
Polychlorinated Biphenyls	MDL (mg/kg)	(mg/kg)	(mg/kg)	
	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.

APPENDIX 6d

Maxxam Analytics Inc. Analytical Reports – Bunkhouse Area
(Current Investigation)

Maxxam Job #: A799260
Report Date: 2007/11/30

Jacques Whitford Limited
Client Project #: 1028976/Z9100 PHASE III ESA
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		U62742	U62914	U62915		
Sampling Date		2007/09/07	2007/09/07	2007/09/07		
COC Number		12116	12116	12116		
Registration #						
	Units	RM-JW07-TP1-BS2	RM-JW07-TP2-BS1	RM-JW07-TP3-BS4	RDL	QC Batch

TPH COMPOUNDS						
Benzene	mg/kg	ND	ND	ND	0.03	1360693
Toluene	mg/kg	ND	ND	ND	0.03	1360693
Ethylbenzene	mg/kg	ND	ND	ND	0.03	1360693
Xylene (Total)	mg/kg	ND	ND	ND	0.05	1360693
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	3	1360693
>C10-C21 Hydrocarbons	mg/kg	ND	ND	1800	15	1362106
>C21-<C32 Hydrocarbons	mg/kg	ND	27	640	15	1362106
Modified TPH (Tier1)	mg/kg	ND	27	2400	20	1358549
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	108	113	105		1362106
Isobutylbenzene - Volatile	%	99	107	95		1360693
n-Dotriacontane - Extractable	%	94	100 (1)	91 (2)		1362106

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) No resemblance to petroleum products in lube oil range.
(2) Weathered fuel oil fraction. Lube oil fraction.

Maxxam Job #: A7A2043
Report Date: 2007/09/26

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: PHASE III ESA, BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75241	U75241	U75243		
Sampling Date		2007/09/19	2007/09/19	2007/09/19		
COC Number		12151	12151	12151		
Registration #						
	Units	RMJW07-MW1-SS4	RMJW07-MW1-SS4 Lab-Dup	RMJW07-MW2-SS3	RDL	QC Batch

INORGANICS						
Moisture	%	14		7	1	1364119
TPH COMPOUNDS						
Benzene	mg/kg	ND		ND	0.03	1364122
Toluene	mg/kg	ND		ND	0.03	1364122
Ethylbenzene	mg/kg	ND		ND	0.03	1364122
Xylene (Total)	mg/kg	ND		ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND		260	3	1364122
>C10-C21 Hydrocarbons	mg/kg	ND	ND	2200	15	1366733
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	97	15	1366733
Modified TPH (Tier1)	mg/kg	ND		2500	20	1363484
Surrogate Recovery (%)						
Isobutylbenzene - Extractable	%	98	96	116		1366733
Isobutylbenzene - Volatile	%	102		206 (1)		1364122
n-Dotriacontane - Extractable	%	109	105	127 (2)		1366733

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Isobutylbenzene recovery not within acceptance limits due to matrix/co-extractive interference.
(2) Weathered fuel oil fraction.

Maxxam Job #: A7A2029
Report Date: 2007/09/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016400
Sampler Initials:

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		U75186	U75187		
Sampling Date		2007/09/19	2007/09/19		
COC Number		12152	12152		
Registration #					
	Units	DUPLICATE #2	DUPLICATE #4	RDL	QC Batch

INORGANICS					
Moisture	%	12	9	1	1364119
TPH COMPOUNDS					
Benzene	mg/kg	ND	ND	0.03	1364122
Toluene	mg/kg	ND	ND	0.03	1364122
Ethylbenzene	mg/kg	ND	ND	0.03	1364122
Xylene (Total)	mg/kg	ND	ND	0.05	1364122
C6 - C10 (less BTEX)	mg/kg	ND	ND	3	1364122
>C10-C21 Hydrocarbons	mg/kg	ND	ND	15	1365188
>C21-<C32 Hydrocarbons	mg/kg	ND	43	15	1365188
Modified TPH (Tier1)	mg/kg	ND	43	20	1363484
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	96	96		1365188
Isobutylbenzene - Volatile	%	115	125		1364122
n-Dotriacontane - Extractable	%	102	106 (1)		1365188

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Lube oil range.

Maxxam Job #: A7A5830
Report Date: 2007/10/03

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC MUST IN WATER - PIRI TIER I (WATER)

Maxxam ID		U92452	U92453		U92454		
Sampling Date		2007/09/20	2007/09/20		2007/09/20		
COC Number		15297	15297		15297		
Registration #							
	Units	RM-JW07-MW1	RM-JW07-MW2	QC Batch	RM-JW07-MW3	RDL	QC Batch

TPH COMPOUNDS							
Benzene	mg/L	ND	ND	1371509	ND	0.001	1371509
Toluene	mg/L	0.002	0.004	1371509	0.005	0.001	1371509
Ethylbenzene	mg/L	ND	0.005	1371509	ND	0.001	1371509
Xylene (Total)	mg/L	0.004	0.004	1371509	0.006	0.002	1371509
C6 - C10 (less BTEX)	mg/L	ND	0.11	1371509	ND	0.01	1371509
>C10-C21 Hydrocarbons	mg/L	0.12	15	1371295	0.40	0.05	1371295
>C21-<C32 Hydrocarbons	mg/L	0.2	1.1	1371295	2.3	0.1	1371295
Modified TPH (Tier1)	mg/L	0.3	16	1369894	2.7	0.1	1370585
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	72	82	1371295	74		1371295
Isobutylbenzene - Volatile	%	102	81	1371509	89		1371509
n-Dotriacontane - Extractable	%	81 (1)	80 (2)	1371295	83 (3)		1371295

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Fuel oil range. Lube oil range.
(2) Weathered fuel oil fraction.
(3) Lube oil fraction.

APPENDIX 6e

GPS Coordinates – Bunkhouse Area

GPS Coordinates - NAD83 - Bunkhouse Area

Location	Northing	Easting
RM-JW07-TP1	565968	5527073
RM-JW07-TP2	565928	5527100
RM-JW07-MW1	565965	5527074
RM-JW07-MW2	565993	5527106

APPENDIX 7

Maxxam Analytics Inc. Analytical Reports
for the Hazardous Materials Assessment

Your P.O. #: NSD016400
Your Project #: 1028976-Z9100
Site: BAIE VERTE/RAMBLER
Your C.O.C. #: 08451

Attention: Paula Brennan
Jacques Whitford Limited
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/10/26

CERTIFICATE OF ANALYSIS

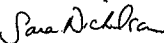
MAXXAM JOB #: A7B4658
Received: 2007/10/18, 10:11

Sample Matrix: Solid
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Asbestos (f)	6	N/A	2007/10/24	ATL SOP-00174	Based on NIOSH9002
Asbestos (f)	9	N/A	2007/10/25	ATL SOP-00174	Based on NIOSH9002

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Sydney, NS (ESL)

Encryption Key  Sara Nicholson
26 Oct 2007 10:49:17 -03:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SHARLENE BAIRD, Project Manager
Email: sharlene.baird.reports@maxxamanalytics.com
Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 1

Page 1 of 7

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		V31969		V31974	V31975		
Sampling Date		2007/09/03		2007/09/03	2007/09/03		
COC Number		08451		08451	08451		
Registration #							
	Units	JW07-BHA-ASB1	QC Batch	JW07-BHA-ASB2	JW07-BHA-ASB3	RDL	QC Batch

INORGANICS							
Asbestos	%	ND	1389589	ND	ND	1	1390671
Chrysotile Asbestos	%	ND	1389589	ND	ND	1	1390671
Amosite Asbestos	%	ND	1389589	ND	ND	1	1390671
Crocidolite Asbestos	%	ND	1389589	ND	ND	1	1390671
Tremolite Asbestos	%	ND	1389589	ND	ND	1	1390671
Cellulose	%	ND	1389589	(1-5)	(80-90)	1	1390671
Mineral Wool	%	ND	1389589	ND	ND	1	1390671
Glass Fibres	%	SEE NOTE	1389589	(1-5)	ND	1	1390671
Hair	%	ND	1389589	ND	ND	1	1390671
Miscellaneous Fibres	%	ND	1389589	ND	ND	1	1390671
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		V31976		V31977	V31978		
Sampling Date		2007/09/03		2007/09/03	2007/09/03		
COC Number		08451		08451	08451		
Registration #							
	Units	JW07-BHA-ASB4	QC Batch	JW07-BHA-ASB5	JW07-BHA-ASB6	RDL	QC Batch

INORGANICS							
Asbestos	%	ND	1389589	ND	ND	1	1390671
Chrysotile Asbestos	%	ND	1389589	ND	ND	1	1390671
Amosite Asbestos	%	ND	1389589	ND	ND	1	1390671
Crocidolite Asbestos	%	ND	1389589	ND	ND	1	1390671
Tremolite Asbestos	%	ND	1389589	ND	ND	1	1390671
Cellulose	%	ND	1389589	(>90)	(>90)	1	1390671
Mineral Wool	%	ND	1389589	ND	ND	1	1390671
Glass Fibres	%	ND	1389589	ND	ND	1	1390671
Hair	%	ND	1389589	ND	ND	1	1390671
Miscellaneous Fibres	%	ND	1389589	ND	ND	1	1390671

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		V31979	V31980	V31981		
Sampling Date		2007/09/03	2007/09/03	2007/09/03		
COC Number		08451	08451	08451		
Registration #						
	Units	JW07-BHA-ASB7	JW07-RMM-ASB1	JW07-RMM-ASB2	RDL	QC Batch

INORGANICS						
Asbestos	%	(1-5)	(1-5)	ND	1	1389589
Chrysotile Asbestos	%	(1-5)	(1-5)	ND	1	1389589
Amosite Asbestos	%	ND	ND	ND	1	1389589
Crocidolite Asbestos	%	ND	ND	ND	1	1389589
Tremolite Asbestos	%	ND	ND	ND	1	1389589
Cellulose	%	ND	ND	ND	1	1389589
Mineral Wool	%	ND	ND	ND	1	1389589
Glass Fibres	%	ND	ND	ND	1	1389589
Hair	%	ND	ND	ND	1	1389589
Miscellaneous Fibres	%	ND	ND	ND	1	1389589

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		V31982		V31983		
Sampling Date		2007/09/03		2007/09/03		
COC Number		08451		08451		
Registration #						
	Units	JW07-RMM-ASB3	QC Batch	LW07-EM-ASB1	RDL	QC Batch

INORGANICS						
Asbestos	%	(10-20)	1390671	(20-40)	1	1389589
Chrysotile Asbestos	%	(10-20)	1390671	(20-40)	1	1389589
Amosite Asbestos	%	ND	1390671	ND	1	1389589
Crocidolite Asbestos	%	ND	1390671	ND	1	1389589
Tremolite Asbestos	%	ND	1390671	ND	1	1389589
Cellulose	%	(5-10)	1390671	ND	1	1389589
Mineral Wool	%	ND	1390671	ND	1	1389589
Glass Fibres	%	ND	1390671	ND	1	1389589
Hair	%	ND	1390671	ND	1	1389589
Miscellaneous Fibres	%	ND	1390671	ND	1	1389589

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID

Maxxam ID		V31984	V31985	V31986	V31987		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08451	08451	08451	08451		
Registration #							
	Units	JW07-EM-ASB2	JW07-ML-ASB1	JW07-WH-ASB1	JW07-BHA-ASB8	RDL	QC Batch

INORGANICS							
Asbestos	%	ND	ND	(5-10)	ND	1	1390671
Chrysotile Asbestos	%	ND	ND	(5-10)	ND	1	1390671
Amosite Asbestos	%	ND	ND	ND	ND	1	1390671
Crocidolite Asbestos	%	ND	ND	ND	ND	1	1390671
Tremolite Asbestos	%	ND	ND	ND	ND	1	1390671
Cellulose	%	(80-90)	ND	ND	(80-90)	1	1390671
Mineral Wool	%	ND	ND	ND	ND	1	1390671
Glass Fibres	%	ND	ND	ND	ND	1	1390671
Hair	%	ND	ND	ND	ND	1	1390671
Miscellaneous Fibres	%	ND	ND	ND	ND	1	1390671

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B4658
Report Date: 2007/10/26

Jacques Whitford Limited
Client Project #: 1028976-Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

GENERAL COMMENTS

Sample V31969-01: <1.0% of glass fibers were found in the sample.

Results relate only to the items tested.

Your P.O. #: NSD016400
Your Project #: 1028976/Z9100
Site: BAIE VERTE/RAMBLER
Your C.O.C. #: 08453

Attention: Paula Brennan
Jacques Whitford Limited
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/10/25

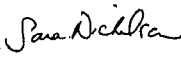
CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A7B4852
Received: 2007/10/18, 10:10

Sample Matrix: Paint
Samples Received: 79

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Mercury in paint	24	N/A	2007/10/22	ATL SOP 00026 R2	Based on EPA 245.5
Mercury in paint	54	N/A	2007/10/23	ATL SOP 00026 R2	Based on EPA 245.5
Mercury in paint	1	N/A	2007/10/24	ATL SOP 00026 R2	Based on EPA 245.5
Lead Paint Avail. OES	52	N/A	2007/10/22	ATL SOP 00025 R2	Based on USEPA 6010B
Lead Paint Avail. OES	27	N/A	2007/10/23	ATL SOP 00025 R2	Based on USEPA 6010B
PCBs in Paint by GC/ECD	17	2007/10/23	2007/10/24		in house
PCBs in Paint by GC/ECD	20	2007/10/23	2007/10/25		in house

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key  Sara Nicholson
25 Oct 2007 15:51:57 -03:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SHARLENE BAIRD, Project Manager
Email: sharlene.baird.reports@maxxamanalytics.com
Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33041		V33071		V33072		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PS1	RDL	JW07-ML-PS2	RDL	JW07-ML-PS3	RDL	QC Batch

ELEMENTS								
Available Lead (Pb)	mg/kg	2000	100	320	100	580	100	1387544
Mercury (Hg)	mg/kg	ND	0.03	0.13	0.06	ND	0.03	1387453
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33073		V33074		V33075		V33076
Sampling Date		2007/09/03		2007/09/03		2007/09/03		2007/09/03
COC Number		08453		08453		08453		08453
Registration #								
	Units	JW07-ML-PS4	RDL	JW07-ML-PS5	JW07-ML-PS6	JW07-ML-PS7	RDL	QC Batch

ELEMENTS								
Available Lead (Pb)	mg/kg	120000	1000	22000	31000	790	100	1387544
Mercury (Hg)	mg/kg	0.04	0.03	0.11	0.21	0.88	0.03	1387453
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33077		V33078		V33078		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PS8	QC Batch	JW07-ML-PS9	JW07-ML-PS9	Lab-Dup	RDL	QC Batch

ELEMENTS								
Available Lead (Pb)	mg/kg	2800	1387544	1600	1600	100	1387546	
Mercury (Hg)	mg/kg	0.06	1387453	0.25		0.03	1387457	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33079	V33080	V33081	V33082		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS10	JW07-ML-PS11	JW07-ML-PS12	JW07-ML-PS13	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	24000	4200	ND	14000	100	1387546
Mercury (Hg)	mg/kg	0.59	0.23	0.08	0.19	0.03	1387457
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33083	V33084	V33085	V33086		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS14	JW07-ML-PS15	JW07-ML-PS16	JW07-ML-PS17	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	2400	5800	4800	240	100	1387546
Mercury (Hg)	mg/kg	ND	0.05	0.05	1.7	0.03	1387457
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33087	V33088	V33089	V33090		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS18	JW07-ML-PS19	JW07-ML-PS20	JW07-ML-PS21	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	2000	1600	2200	ND	100	1387546
Mercury (Hg)	mg/kg	0.60	0.10	0.23	ND	0.03	1387457
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33091	V33092		V33093		
Sampling Date		2007/09/03	2007/09/03		2007/09/03		
COC Number		08453	08453		08453		
Registration #							
	Units	JW07-ML-PS22	JW07-ML-PS23	QC Batch	JW07-ML-PS24	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	ND	310	1387546	1100	100	1387546
Mercury (Hg)	mg/kg	ND	0.11	1387457	0.03	0.03	1389321
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33094		V33095	V33096		
Sampling Date		2007/09/03		2007/09/03	2007/09/03		
COC Number		08453		08453	08453		
Registration #							
	Units	JW07-ML-PS25	QC Batch	JW07-ML-PS26	JW07-ML-PS27	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	ND	1387546	ND	650	100	1387546
Mercury (Hg)	mg/kg	0.04	1387457	0.12	0.23	0.03	1388739
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33097	V33098		V33099		
Sampling Date		2007/09/03	2007/09/03		2007/09/03		
COC Number		08453	08453		08453		
Registration #							
	Units	JW07-ML-PS28	JW07-ML-PS29	RDL	JW07-ML-PS30	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	8100	6500	100	15000	100	1387546
Mercury (Hg)	mg/kg	0.25	0.88	0.03	4.2	0.2	1388739
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33100	V33100	V33101		
Sampling Date		2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453		
Registration #						
	Units	JW07-ML-PS31	JW07-ML-PS31 Lab-Dup	JW07-ML-PS32	RDL	QC Batch

ELEMENTS						
Available Lead (Pb)	mg/kg	24000	25000	140	100	1387872
Mercury (Hg)	mg/kg	0.58		0.38	0.03	1388739
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V33102		V33103	V33104	
Sampling Date		2007/09/03		2007/09/03	2007/09/03	
COC Number		08453		08453	08453	
Registration #						
	Units	JW07-ML-PS33	RDL	JW07-ML-PS34	JW07-ML-PS35	RDL QC Batch

ELEMENTS						
Available Lead (Pb)	mg/kg	120000	500	730	12000	100 1387872
Mercury (Hg)	mg/kg	0.21	0.03	0.07	0.16	0.03 1388739
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V33105	V33106	V33107	V33108	
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03	
COC Number		08453	08453	08453	08453	
Registration #						
	Units	JW07-ML-PS36	JW07-ML-PS37	JW07-ML-PS38	JW07-ML-PS39	RDL QC Batch

ELEMENTS						
Available Lead (Pb)	mg/kg	24000	4500	8900	250	100 1387872
Mercury (Hg)	mg/kg	0.06	0.13	1.0	0.09	0.03 1388739
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33109		V33110		V33111		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PS40	RDL	JW07-ML-PS41	RDL	JW07-ML-PS42	RDL	QC Batch

ELEMENTS								
Available Lead (Pb)	mg/kg	120	100	150000	500	64000	500	1387872
Mercury (Hg)	mg/kg	0.29	0.03	0.58	0.03	11	0.2	1388739
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33112		V33113		V33114		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PS43	QC Batch	JW07-ML-PS44	JW07-ML-PS45	RDL	QC Batch	

ELEMENTS								
Available Lead (Pb)	mg/kg	5900	1387872	1800	1800	100	1387872	
Mercury (Hg)	mg/kg	0.08	1388739	0.77	0.23	0.03	1388743	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33115		V33116		V33117		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PS46	JW07-ML-PS47	JW07-ML-PS48	RDL	QC Batch		

ELEMENTS								
Available Lead (Pb)	mg/kg	3100	2200	2000	100	1387872		
Mercury (Hg)	mg/kg	0.50	0.14	1.4	0.03	1388743		
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33118		V33119		
Sampling Date		2007/09/03		2007/09/03		
COC Number		08453		08453		
Registration #						
	Units	JW07-ML-PS49	RDL	JW07-ML-PS50	RDL	QC Batch

ELEMENTS						
Available Lead (Pb)	mg/kg	100000	500	48000	100	1387872
Mercury (Hg)	mg/kg	0.25	0.03	15	0.8	1388743
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V33120		V33121		
Sampling Date		2007/09/03		2007/09/03		
COC Number		08453		08453		
Registration #						
	Units	JW07-ML-PSS1	RDL	JW07-ML-PSS2	RDL	QC Batch

ELEMENTS						
Available Lead (Pb)	mg/kg	1900	100	69000	500	1387872
Mercury (Hg)	mg/kg	0.38	0.03	0.13	0.03	1388743
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

Maxxam ID		V33122	V33122	V33123	V33124		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PSS3	JW07-ML-PSS3 Lab-Dup	JW07-ML-PSS4	JW07-ML-PSS5	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	770	810	1900	5600	50	1388313
Mercury (Hg)	mg/kg	ND		1.1	0.59	0.03	1388743
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33125		V33126		V33127		
Sampling Date		2007/09/03		2007/09/03		2007/09/03		
COC Number		08453		08453		08453		
Registration #								
	Units	JW07-ML-PSS6	RDL	JW07-ML-PSS7	RDL	JW07-WH-PS1	RDL	QC Batch

ELEMENTS								
Available Lead (Pb)	mg/kg	480	50	130000	500	2100	50	1388313
Mercury (Hg)	mg/kg	0.08	0.03	0.20	0.03	10	0.2	1388743
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33128		V33129				
Sampling Date		2007/09/03		2007/09/03				
COC Number		08453		08453				
Registration #								
	Units	JW07-BHA-PS1	RDL	JW07-BHA-PS2	RDL	QC Batch		

ELEMENTS								
Available Lead (Pb)	mg/kg	4000	50	1900	50	1388313		
Mercury (Hg)	mg/kg	18	0.8	9.9	0.2	1388743		
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam ID		V33130	V33131		V33132			
Sampling Date		2007/09/03	2007/09/03		2007/09/03			
COC Number		08453	08453		08453			
Registration #								
	Units	JW07-BHA-PS3	JW07-RMM-PS1	QC Batch	JW07-RMM-PS2	RDL	QC Batch	

ELEMENTS								
Available Lead (Pb)	mg/kg	420	16000	1388313	110	50	1388313	
Mercury (Hg)	mg/kg	1.1	0.42	1388743	ND	0.03	1388745	
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33133		V33134	V33135		
Sampling Date		2007/09/03		2007/09/03	2007/09/03		
COC Number		08453		08453	08453		
Registration #							
	Units	JW07-RMM-PS3	RDL	JW07-RMM-PS4	JW07-RMM-PS5	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	1600	50	2700	340	50	1388313
Mercury (Hg)	mg/kg	1.9	0.03	5.8	3.5	0.2	1388745
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33136	V33137	V33138	V33139		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-RMM-PS6	JW07-RMM-PS7	JW07-RMM-PS8	JW07-RMM-PS9	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	2600	ND	80	190	50	1388313
Mercury (Hg)	mg/kg	0.07	0.05	ND	0.04	0.03	1388745
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33140	V33141	V33142	V33143		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-RMM-PS10	JW07-RMM-PS11	JW07-EM-PS1	JW07-EM-PS2	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	71	ND	170	36000	50	1388313
Mercury (Hg)	mg/kg	0.05	ND	0.17	0.19	0.03	1388745
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		V33144	V33144	V33145	V33146		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-EM-PS3	JW07-EM-PS3 Lab-Dup	JW07-EM-PS4	JW07-EM-PS5	RDL	QC Batch

ELEMENTS							
Available Lead (Pb)	mg/kg	4800	5000	35000	610	50	1388314
Mercury (Hg)	mg/kg	0.38		0.43	0.10	0.03	1388745
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33147	V33148		
Sampling Date		2007/09/03	2007/09/03		
COC Number		08453	08453		
Registration #					
	Units	JW07-EM-PS6	JW07-EM-PS7	RDL	QC Batch

ELEMENTS					
Available Lead (Pb)	mg/kg	150	40000	50	1388314
Mercury (Hg)	mg/kg	0.09	0.21	0.03	1388745
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33072	V33072	V33073	V33075		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS3	JW07-ML-PS3 Lab-Dup	JW07-ML-PS4	JW07-ML-PS6	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386117
Surrogate Recovery (%)							
Decachlorobiphenyl	%	39	30	65	58		1386117
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam ID		V33077	V33079	V33081	V33083		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS8	JW07-ML-PS10	JW07-ML-PS12	JW07-ML-PS14	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386117
Surrogate Recovery (%)							
Decachlorobiphenyl	%	68	35	45	68		1386117
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33085	V33087	V33089	V33090		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS16	JW07-ML-PS18	JW07-ML-PS20	JW07-ML-PS21	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386117
Surrogate Recovery (%)							
Decachlorobiphenyl	%	53	47	50	23 (1)		1386117

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam ID		V33092	V33094	V33096	V33098		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS23	JW07-ML-PS25	JW07-ML-PS27	JW07-ML-PS29	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386117
Surrogate Recovery (%)							
Decachlorobiphenyl	%	47	36	22 (1)	23 (1)		1386117

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33100	V33102	V33104	V33106		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS31	JW07-ML-PS33	JW07-ML-PS35	JW07-ML-PS37	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386117
Surrogate Recovery (%)							
Decachlorobiphenyl	%	41	23 (1)	16 (1)	18 (1)		1386117

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam ID		V33108		V33111	V33111		
Sampling Date		2007/09/03		2007/09/03	2007/09/03		
COC Number		08453		08453	08453		
Registration #							
	Units	JW07-ML-PS39	QC Batch	JW07-ML-PS42	JW07-ML-PS42	RDL	QC Batch
				Lab-Dup			

PCBs							
Total PCB	mg/kg	ND	1386117	ND	ND	5	1386138
Surrogate Recovery (%)							
Decachlorobiphenyl	%	28 (1)	1386117	19 (1)	18 (2)		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.
(2) Please refer to General Comments page for specific clarification.

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33113	V33115	V33117	V33119		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PS44	JW07-ML-PS46	JW07-ML-PS48	JW07-ML-PS50	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386138
Surrogate Recovery (%)							
Decachlorobiphenyl	%	42	22 (1)	54	29 (1)		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam ID		V33122	V33123	V33124	V33125		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-ML-PSS3	JW07-ML-PSS4	JW07-ML-PSS5	JW07-ML-PSS6	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386138
Surrogate Recovery (%)							
Decachlorobiphenyl	%	18 (1)	41	20 (1)	28 (1)		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33127	V33128	V33130	V33132		
Sampling Date		2007/09/03	2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453	08453		
Registration #							
	Units	JW07-WH-PS1	JW07-BHA-PS1	JW07-BHA-PS3	JW07-RMM-PS2	RDL	QC Batch

PCBs							
Total PCB	mg/kg	ND	ND	ND	ND	5	1386138
Surrogate Recovery (%)							
Decachlorobiphenyl	%	27 (1)	70	80	79		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam ID		V33134	V33136	V33138		
Sampling Date		2007/09/03	2007/09/03	2007/09/03		
COC Number		08453	08453	08453		
Registration #						
	Units	JW07-RMM-PS4	JW07-RMM-PS6	JW07-RMM-PS8	RDL	QC Batch

PCBs						
Total PCB	mg/kg	ND	ND	ND	5	1386138
Surrogate Recovery (%)						
Decachlorobiphenyl	%	26 (1)	9.7 (1)	66		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

POLYCHLORINATED BIPHENYLS BY GC-ECD (PAINT)

Maxxam ID		V33140		
Sampling Date		2007/09/03		
COC Number		08453		
Registration #				
	Units	JW07-RMM-PS10	RDL	QC Batch

PCBs				
Total PCB	mg/kg	ND	5	1386138
Surrogate Recovery (%)				
Decachlorobiphenyl	%	95		1386138

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B4852
Report Date: 2007/10/25

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

GENERAL COMMENTS

Sample V33071-01: Lead: Elevated detection limit due to blank performance.
Sample V33072-01: Lead: Elevated detection limit due to blank performance.
Sample V33076-01: Lead: Elevated detection limit due to blank performance.
Sample V33093-01: Mercury analysis done on an aliquot of the prepared lead digest due to limited sample.

Results relate only to the items tested.

Jacques Whitford Limited
Attention: Paula Brennan
Client Project #: 1028976/Z9100
P.O. #: NSD016400
Project name: BAIE VERTE/RAMBLER

Quality Assurance Report
Maxxam Job Number: DA7B4852

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1386117 RST	MATRIX SPIKE [V33072-01]	Decachlorobiphenyl	2007/10/25		43	%	30 - 130
		Total PCB	2007/10/25		23 (1)	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2007/10/25		74	%	30 - 130
		Total PCB	2007/10/25		102	%	60 - 130
	Method Blank	Decachlorobiphenyl	2007/10/25		84	%	30 - 130
		Total PCB	2007/10/25		ND, RDL=5		mg/kg
1386138 RST	MATRIX SPIKE [V33111-01]	Decachlorobiphenyl	2007/10/24		11 (2)	%	30 - 130
		Total PCB	2007/10/24		14 (1)	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2007/10/24		78	%	30 - 130
		Total PCB	2007/10/24		97	%	60 - 130
	Method Blank	Decachlorobiphenyl	2007/10/24		87	%	30 - 130
		Total PCB	2007/10/24		ND, RDL=5		mg/kg
1387453 SSI	QC STANDARD	Mercury (Hg)	2007/10/22		101	%	75 - 125
	Spiked Blank	Mercury (Hg)	2007/10/22		100	%	75 - 125
	Method Blank	Mercury (Hg)	2007/10/22		ND, RDL=0.03		mg/kg
1387457 SSI	QC STANDARD	Mercury (Hg)	2007/10/22		105	%	75 - 125
	Spiked Blank	Mercury (Hg)	2007/10/22		104	%	75 - 125
	Method Blank	Mercury (Hg)	2007/10/22		ND, RDL=0.03		mg/kg
1387544 MLB	MATRIX SPIKE	Available Lead (Pb)	2007/10/22		97	%	75 - 125
	QC STANDARD	Available Lead (Pb)	2007/10/22		107	%	75 - 125
	Spiked Blank	Available Lead (Pb)	2007/10/22		92	%	75 - 125
	Method Blank	Available Lead (Pb)	2007/10/22		ND, RDL=50		mg/kg
	RPD	Available Lead (Pb)	2007/10/22		NC		%
1387546 MLB	MATRIX SPIKE [V33078-01]	Available Lead (Pb)	2007/10/22		80	%	75 - 125
	QC STANDARD	Available Lead (Pb)	2007/10/22		98	%	75 - 125
	Spiked Blank	Available Lead (Pb)	2007/10/22		97	%	75 - 125
	Method Blank	Available Lead (Pb)	2007/10/22		ND, RDL=50		mg/kg
	RPD [V33078-01]	Available Lead (Pb)	2007/10/22		1.9	%	25
	1387872 MLB	MATRIX SPIKE [V33100-01]	Available Lead (Pb)	2007/10/22		NC	%
QC STANDARD		Available Lead (Pb)	2007/10/22		95	%	75 - 125
Spiked Blank		Available Lead (Pb)	2007/10/22		86	%	75 - 125
Method Blank		Available Lead (Pb)	2007/10/22		ND, RDL=50		mg/kg
RPD [V33100-01]		Available Lead (Pb)	2007/10/22		3.7	%	25
1388313 MLB		MATRIX SPIKE [V33122-01]	Available Lead (Pb)	2007/10/23		82	%
	QC STANDARD	Available Lead (Pb)	2007/10/23		107	%	75 - 125
	Spiked Blank	Available Lead (Pb)	2007/10/23		95	%	75 - 125
	Method Blank	Available Lead (Pb)	2007/10/23		ND, RDL=50		mg/kg
	RPD [V33122-01]	Available Lead (Pb)	2007/10/23		4.3	%	25
	1388314 MLB	MATRIX SPIKE [V33144-01]	Available Lead (Pb)	2007/10/23		NC	%
QC STANDARD		Available Lead (Pb)	2007/10/23		100	%	75 - 125
Spiked Blank		Available Lead (Pb)	2007/10/23		90	%	75 - 125
Method Blank		Available Lead (Pb)	2007/10/23		ND, RDL=50		mg/kg
RPD [V33144-01]		Available Lead (Pb)	2007/10/23		3.8	%	25
1388739 SSI		QC STANDARD	Mercury (Hg)	2007/10/23		92	%
	Spiked Blank	Mercury (Hg)	2007/10/23		96	%	75 - 125
	Method Blank	Mercury (Hg)	2007/10/23		ND, RDL=0.03		mg/kg
1388743 SSI	QC STANDARD	Mercury (Hg)	2007/10/23		97	%	75 - 125

Jacques Whitford Limited
Attention: Paula Brennan
Client Project #: 1028976/Z9100
P.O. #: NSD016400
Project name: BAIE VERTE/RAMBLER

Quality Assurance Report (Continued)

Maxxam Job Number: DA7B4852

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1388743 SSI	Spiked Blank	Mercury (Hg)	2007/10/23		98	%	75 - 125
	Method Blank	Mercury (Hg)	2007/10/23	ND, RDL=0.03		mg/kg	
1388745 SSI	QC STANDARD	Mercury (Hg)	2007/10/23		91	%	75 - 125
	Spiked Blank	Mercury (Hg)	2007/10/23		102	%	75 - 125
	Method Blank	Mercury (Hg)	2007/10/23	ND, RDL=0.03		mg/kg	
1389321 SSI	Method Blank	Mercury (Hg)	2007/10/24	ND, RDL=0.03		mg/kg	

ND = Not detected
 NC = Non-calculable
 RPD = Relative Percent Difference
 QC Standard = Quality Control Standard
 SPIKE = Fortified sample
 (1) Matrix Spike: results are outside acceptance limit. Analysis was repeated with similar results.
 (2) PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

Your P.O. #: NSD016300
Your Project #: 1028976/Z9100
Site: BAIE VERT/RAMBLER
Your C.O.C. #: N/A

Attention: Paula Brennan
Jacques Whitford Limited
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/12/05

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A7B9289
Received: 2007/10/29, 10:34

Sample Matrix: Leachate
Samples Received: 52

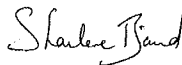
Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Mercury - Total (CVAA,LL)	3	N/A	2007/11/05	ATL SOP 00026 R2	Based on EPA245.1
Metals Water Total OES - Partial Scan	16	N/A	2007/11/02	ATL SOP 00025 R3	Based on EPA200.7
Metals Water Total OES - Partial Scan	4	N/A	2007/11/05	ATL SOP 00025 R3	Based on EPA200.7
Metals Water Total OES - Partial Scan	32	N/A	2007/11/06	ATL SOP 00025 R3	Based on EPA200.7

Sample Matrix: Paint
Samples Received: 56

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Asbestos Ø	2	N/A	2007/11/05	ATL SOP-00174	Based on NIOSH9002
Moisture	56	N/A	2007/10/30	ATL SOP 00001 R2	MOE Handbook 1983
TCLP Inorganic extraction - pH	52	N/A	2007/11/02	4100_1_1	Based on EPA1311
TCLP Inorganic extraction - Weight	52	N/A	2007/11/02	4100_1_1	Based on EPA1311

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Sydney, NS (ESL)

 Sharlene Baird
05 Dec 2007 16:10:55 -04:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SHARLENE BAIRD, Project Manager
Email: sharlene.baird.reports@maxxamanalytics.com
Phone# (902) 420-0203

Your P.O. #: NSD016300
Your Project #: 1028976/Z9100
Site: BAIE VERT/RAMBLER
Your C.O.C. #: N/A

Attention: Paula Brennan
Jacques Whitford Limited
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/12/05

CERTIFICATE OF ANALYSIS

-2-

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 2

Page 2 of 35

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53100	V53101		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS4 (P#V33073)	JW07-ML-PS5 (P#V33074)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	37	10	0.5	1396839
<p>N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch</p>					

Maxxam ID		V53102	V53103		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS6 (P#V33075)	JW07-ML-PS7 (P#V33076)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	5.5	ND	0.5	1396839
<p>ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch</p>					

Maxxam ID		V53104	V53104		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS8 (P#V33077)	JW07-ML-PS8 (P#V33077) Lab-Dup	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.8	1.0	0.5	1396839
<p>N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch</p>					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53105	V53107		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS9 (P#V33078)	JW07-ML-PS11 (P#V33080)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	ND	0.5	1396839
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53108	V53109		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS13 (P#V33082)	JW07-ML-PS14 (P#V33083)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	2.0	ND	0.5	1396839
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53110	V53111		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS15 (P#V33084)	JW07-ML-PS16 (P#V33085)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.6	6.3	0.5	1396839
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53112	V53113		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS18 (P#V33087)	JW07-ML-PS19 (P#V33088)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.8	0.7	0.5	1396839
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53114	V53116		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS20 (P#V33089)	JW07-ML-PS27 (P#V33096)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	1.9	0.5	1396839
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53117	V53118		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS28 (P#V33097)	QC Batch	JW07-ML-PS29 (P#V33098)	RDL QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	3.5	1396839	1.2	0.5 1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53119	V53120		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS30 (P#V33099)	JW07-ML-PS31 (P#V33100)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	1.8	ND	0.5	1397224
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53120	V53121		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS31 (P#V33100) Lab-Dup	JW07-ML-PS33 (P#V33102)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	4.9	0.5	1397224
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53122	V53123		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS34 (P#V33103)	JW07-ML-PS35 (P#V33104)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	1.3	13	0.5	1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53124	V53124		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS36 (P#V33105)	JW07-ML-PS36 (P#V33105) Lab-Dup	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	0.5	0.5	1397224
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53125	V53126		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS37 (P#V33106)	JW07-ML-PS38 (P#V33107)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	2.6	0.6	0.5	1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53127	V53128		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS41 (P#V33110)	JW07-ML-PS42 (P#V33111)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	17	2.4	0.5	1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53129	V53130		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS43 (P#V33112)	JW07-ML-PS44 (P#V33113)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	4.8	0.8	0.5	1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53131	V53132		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS45 (P#V33114)	JW07-ML-PS46 (P#V33115)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	1.1	2.8	0.5	1397224
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53133	V53136		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS47 (P#V33116)	JW07-ML-PS50 (P#V33119)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	9.7	0.9	0.5	1398901
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53137	V53138		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS51 (P#V33120)	JW07-ML-PS52 (P#V33121)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.7	1.7	0.5	1398901
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53139	V53140		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS54 (P#V33123)	JW07-ML-PS55 (P#V33124)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.7	0.8	0.5	1398901
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53141	V53142		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS57 (P#V33126)	JW07-WH-PS1 (P#V33127)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	3.0	ND	0.5	1398901
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53143	V53144		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-BHA-PS1 (P#V33128)	JW07-BHA-PS2 (P#V33129)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	0.5	ND	0.5	1398901
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53145	V53146		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS1 (P#V33131)	JW07-RMM-PS3 (P#V33133)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	9.4	ND	0.5	1398901
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53147	V53148		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS4 (P#V33134)	JW07-RMM-PS6 (P#V33136)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	0.6	0.5	1398901
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (LEACHATE)

Maxxam ID		V53149	V53150		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS10 (P#V33140)	JW07-EM-PS2 (P#V33143)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	15	0.5	1398901
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53151	V53152		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-EM-PS3 (P#V33144)	JW07-EM-PS4 (P#V33145)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	2.9	8.4	0.5	1397990
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53153	V53154		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-EM-PS5 (P#V33146)	JW07-EM-PS7 (P#V33148)	RDL	QC Batch

Elements (ICP-OES)					
Total Lead (Pb)	mg/L	ND	15	0.5	1397990
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53083	V53100		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS1 (P#V33041)	JW07-ML-PS4 (P#V33073)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g		2.5	N/A	1396519
Initial pH	N/A		NA		1396511
Final pH	N/A		5.0		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53101	V53102		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS5 (P#V33074)	JW07-ML-PS6 (P#V33075)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	20	2.5	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.0	5.1		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53103	V53104		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS7 (P#V33076)	JW07-ML-PS8 (P#V33077)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	20	2.5	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.1	5.2		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53104	V53105		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS8 (P#V33077) Lab-Dup	JW07-ML-PS9 (P#V33078)	RDL	QC Batch

INORGANICS					
Moisture	%		ND	1	1393106
Sample Weight (as received)	g	2.5	20	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.2	5.1		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53106	V53107		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS10 (P#V33079)	JW07-ML-PS11 (P#V33080)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g		10	N/A	1396519
Initial pH	N/A		NA		1396511
Final pH	N/A		5.3		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53108	V53109		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS13 (P#V33082)	JW07-ML-PS14 (P#V33083)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	10	20	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.0	5.0		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53110	V53111		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS15 (P#V33084)	JW07-ML-PS16 (P#V33085)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	2.5	10	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.7	5.0		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53112	V53113		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS18 (P#V33087)	JW07-ML-PS19 (P#V33088)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	20	10	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.0	5.5		1396511

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53114	V53115		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS20 (P#V33089)	JW07-ML-PS24 (P#V33093)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	2.5		N/A	1396519
Initial pH	N/A	NA			1396511
Final pH	N/A	5.0			1396511
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53116	V53117		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS27 (P#V33096)	JW07-ML-PS28 (P#V33097)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	2.5	10	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.0	5.6		1396511
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53118	V53119		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS29 (P#V33098)	JW07-ML-PS30 (P#V33099)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393106
Sample Weight (as received)	g	2.5	10	N/A	1396519
Initial pH	N/A	NA	NA		1396511
Final pH	N/A	5.1	5.3		1396511
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53120	V53120		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS31 (P#V33100)	JW07-ML-PS31 (P#V33100) Lab-Dup	RDL	QC Batch

INORGANICS					
Moisture	%	ND		1	1393106
Sample Weight (as received)	g	20	20	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.4	5.3		1396512
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53121		
Sampling Date		2007/09/07		
COC Number		N/A		
Registration #				
	Units	JW07-ML-PS33 (P#V33102)	RDL	QC Batch

INORGANICS				
Moisture	%	ND	1	1393116
Sample Weight (as received)	g	2.5	N/A	1396519
Initial pH	N/A	NA		1396511
Final pH	N/A	5.0		1396511
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam ID		V53122	V53123		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS34 (P#V33103)	JW07-ML-PS35 (P#V33104)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	10	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.0	5.1		1396512
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53124	V53124		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS36 (P#V33105)	JW07-ML-PS36 (P#V33105) Lab-Dup	RDL	QC Batch

INORGANICS					
Moisture	%	ND		1	1393116
Sample Weight (as received)	g	2.5	2.5	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	5.3	5.2		1396516

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53125	V53126		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS37 (P#V33106)	JW07-ML-PS38 (P#V33107)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.1	5.1		1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53127	V53128		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS41 (P#V33110)	JW07-ML-PS42 (P#V33111)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	1.6	10	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.0	5.3		1396512
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53129	V53130		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS43 (P#V33112)	JW07-ML-PS44 (P#V33113)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.0	5.7		1396512
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53131	V53132		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS45 (P#V33114)	JW07-ML-PS46 (P#V33115)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.2	5.2		1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53133	V53134		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS47 (P#V33116)	JW07-ML-PS48 (P#V33117)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5		N/A	1396522
Initial pH	N/A	NA			1396512
Final pH	N/A	5.3			1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53135	V53136		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS49 (P#V33118)	JW07-ML-PS50 (P#V33119)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	8.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.0	5.1		1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53137	V53138		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS51 (P#V33120)	JW07-ML-PS52 (P#V33121)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.2	4.9		1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53139	V53140		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS54 (P#V33123)	JW07-ML-PS55 (P#V33124)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	10	2.5	N/A	1396522
Initial pH	N/A	NA	NA		1396512
Final pH	N/A	5.0	5.1		1396512

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		V53141	V53142		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS57 (P#V33126)	JW07-WH-PS1 (P#V33127)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393116
Sample Weight (as received)	g	2.5	10	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	5.0	5.4		1396516

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
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Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53143	V53144		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-BHA-PS1 (P#V33128)	JW07-BHA-PS2 (P#V33129)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	20	20	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	6.0	5.6		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53145	V53146		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS1 (P#V33131)	JW07-RMM-PS3 (P#V33133)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	2.5	2.5	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	5.1	5.8		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53147	V53148		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS4 (P#V33134)	JW07-RMM-PS6 (P#V33136)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	20	10	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	5.0	5.0		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53149	V53150		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-RMM-PS10 (P#V33140)	JW07-EM-PS2 (P#V33143)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	2.5	2.5	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	6.0	5.2		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

ATLANTIC TCLP LEACHATE + LEAD ICP-OES (PAINT)

Maxxam ID		V53151	V53152		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-EM-PS3 (P#V33144)	JW07-EM-PS4 (P#V33145)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	2.5	2.5	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	5.1	5.0		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53153	V53154		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-EM-PS5 (P#V33146)	JW07-EM-PS7 (P#V33148)	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1393122
Sample Weight (as received)	g	20	2.5	N/A	1396523
Initial pH	N/A	NA	NA		1396516
Final pH	N/A	6.5	5.1		1396516
ND = Not detected N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
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Jacques Whitford Limited
Client Project #: 1028976/Z9100
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Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Maxxam ID		V53128	V53135		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS42 (P#V33111)	JW07-ML-PS49 (P#V33118)	RDL	QC Batch

ELEMENTS					
Total Mercury (Hg)	ug/L	0.26		0.01	1398445
Elements (ICP-OES)					
Total Lead (Pb)	mg/L		2.7	0.5	1398901
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam ID		V53136	V53142		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS50 (P#V33119)	JW07-WH-PS1 (P#V33127)	RDL	QC Batch

ELEMENTS					
Total Mercury (Hg)	ug/L	0.33	0.07	0.01	1398445
N/A = Not Applicable RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

Maxxam Job #: A7B9289
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Jacques Whitford Limited
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Sampler Initials:

RESULTS OF ANALYSES OF PAINT

Maxxam ID		V53106	V53134		
Sampling Date		2007/09/07	2007/09/07		
COC Number		N/A	N/A		
Registration #					
	Units	JW07-ML-PS10 (P#V33079)	JW07-ML-PS48 (P#V33117)	RDL	QC Batch

INORGANICS					
Asbestos	%	(1-5)	(1-5)	1	1398089
Chrysotile Asbestos	%	(1-5)	(1-5)	1	1398089
Amosite Asbestos	%	ND	ND	1	1398089
Crocidolite Asbestos	%	ND	ND	1	1398089
Tremolite Asbestos	%	ND	ND	1	1398089
Cellulose	%	(5-10)	(10-20)	1	1398089
Mineral Wool	%	ND	ND	1	1398089
Glass Fibres	%	(5-10)	ND	1	1398089
Hair	%	ND	ND	1	1398089
Miscellaneous Fibres	%	ND	ND	1	1398089

ND = Not detected
N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7B9289
Report Date: 2007/12/05

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERT/RAMBLER
Your P.O. #: NSD016300
Sampler Initials:

GENERAL COMMENTS

Sample V53083-01: Moisture value reported is a visual estimate for calculation purposes.

Sample V53100-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53101-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53102-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53103-00: Lead: Elevated detection limit due to matrix interference.

Sample V53103-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53104-00: Lead: Elevated detection limit due to matrix interference.

Sample V53104-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53105-00: Lead: Elevated detection limit due to matrix interference.

Sample V53105-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53106-01: Moisture value reported is a visual estimate for calculation purposes.

Sample V53107-00: Lead: Elevated detection limit due to matrix interference.

Sample V53107-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53108-00: Lead: Elevated detection limit due to matrix interference.

Sample V53108-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53109-00: Lead: Elevated detection limit due to matrix interference.

Sample V53109-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.

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Sampler Initials:

Minimal impact on sample data quality.

Sample V53110-00: Lead: Elevated detection limit due to matrix interference.

Sample V53110-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53111-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53112-00: Lead: Elevated detection limit due to matrix interference.

Sample V53112-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53113-00: Lead: Elevated detection limit due to matrix interference.

Sample V53113-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53114-00: Lead: Elevated detection limit due to matrix interference.

Sample V53114-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53115-01: Moisture value reported is a visual estimate for calculation purposes.

Sample V53116-00: Lead: Elevated detection limit due to matrix interference.

Sample V53116-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53117-00: Lead: Elevated detection limit due to matrix interference.

Sample V53117-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53118-00: Lead: Elevated detection limit due to matrix interference.

Sample V53118-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53119-00: Lead: Elevated detection limit due to matrix interference.

Sample V53119-01: Moisture value reported is a visual estimate for calculation purposes.

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Sampler Initials:

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53120-00: Lead: Elevated detection limit due to matrix interference.

Sample V53120-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53121-00: Lead: Elevated detection limit due to matrix interference.

Sample V53121-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53122-00: Lead: Elevated detection limit due to matrix interference.

Sample V53122-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53123-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53124-00: Lead: Elevated detection limit due to matrix interference.

Sample V53124-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53125-00: Lead: Elevated detection limit due to matrix interference.

Sample V53125-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53126-00: Lead: Elevated detection limit due to matrix interference.

Sample V53126-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53127-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample V53128-00: Lead: Elevated detection limit due to matrix interference.

Sample V53128-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.

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Jacques Whitford Limited
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Your P.O. #: NSD016300
Sampler Initials:

Minimal impact on sample data quality.

Sample V53129-00: Lead: Elevated detection limit due to matrix interference.

Sample V53129-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53130-00: Lead: Elevated detection limit due to matrix interference.

Sample V53130-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53131-00: Lead: Elevated detection limit due to matrix interference.

Sample V53131-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53132-00: Lead: Elevated detection limit due to matrix interference.

Sample V53132-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53133-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53134-01: Moisture value reported is a visual estimate for calculation purposes.

Sample V53135-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53136-00: Lead: Elevated detection limit due to matrix interference.

Sample V53136-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53137-00: Lead: Elevated detection limit due to matrix interference.

Sample V53137-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53138-00: Lead: Elevated detection limit due to matrix interference.

Sample V53138-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.

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Sampler Initials:

Minimal impact on sample data quality.

Sample V53139-00: Lead: Elevated detection limit due to matrix interference.

Sample V53139-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53140-00: Lead: Elevated detection limit due to matrix interference.

Sample V53140-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53141-00: Lead: Elevated detection limit due to matrix interference.

Sample V53141-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53142-00: Lead: Elevated detection limit due to matrix interference.

Sample V53142-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53143-00: Lead: Elevated detection limit due to matrix interference.

Sample V53143-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53144-00: Lead: Elevated detection limit due to matrix interference.

Sample V53144-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53145-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53146-00: Lead: Elevated detection limit due to matrix interference.

Sample V53146-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53147-00: Lead: Elevated detection limit due to matrix interference.

Sample V53147-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.

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Jacques Whitford Limited
Client Project #: 1028976/Z9100
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Sampler Initials:

Minimal impact on sample data quality.

Sample V53148-00: Lead: Elevated detection limit due to matrix interference.

Sample V53148-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53149-00: Lead: Elevated detection limit due to matrix interference.

Sample V53149-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53150-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53151-00: Lead: Elevated detection limit due to matrix interference.

Sample V53151-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53152-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53153-00: Lead: Elevated detection limit due to matrix interference.

Sample V53153-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Sample V53154-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained.
Minimal impact on sample data quality.

Results relate only to the items tested.

Jacques Whitford Limited
Attention: Paula Brennan
Client Project #: 1028976/Z9100
P.O. #: NSD016300
Project name: BAIE VERT/RAMBLER

Quality Assurance Report
Maxxam Job Number: DA7B9289

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1396519 AMC	RPD [V53104-01]	Sample Weight (as received)	2007/11/02	0		%	N/A
1396522 AMC	RPD [V53120-01]	Sample Weight (as received)	2007/11/02	0		%	N/A
1396523 AMC	RPD [V53124-01]	Sample Weight (as received)	2007/11/02	0		%	N/A
1396839 MLB	MATRIX SPIKE	Total Lead (Pb)	2007/11/02		93	%	80 - 120
	QC STANDARD	Total Lead (Pb)	2007/11/02		85	%	80 - 120
	Spiked Blank	Total Lead (Pb)	2007/11/02		92	%	80 - 120
	Method Blank	Total Lead (Pb)	2007/11/02	ND, RDL=0.05		mg/L	
	RPD [V53104-00]	Total Lead (Pb)	2007/11/02	NC		%	25
1397224 MLB	MATRIX SPIKE	Total Lead (Pb)	2007/11/06		94	%	80 - 120
	QC STANDARD	Total Lead (Pb)	2007/11/06		82	%	80 - 120
	Spiked Blank	Total Lead (Pb)	2007/11/06		90	%	80 - 120
	Method Blank	Total Lead (Pb)	2007/11/06	ND, RDL=0.05		mg/L	
	RPD [V53120-00]	Total Lead (Pb)	2007/11/06	NC		%	25
	RPD [V53124-00]	Total Lead (Pb)	2007/11/06	NC		%	25
1397990 MLB	MATRIX SPIKE	Total Lead (Pb)	2007/11/05		98	%	80 - 120
	QC STANDARD	Total Lead (Pb)	2007/11/05		114	%	80 - 120
	Spiked Blank	Total Lead (Pb)	2007/11/05		92	%	80 - 120
	Method Blank	Total Lead (Pb)	2007/11/05	ND, RDL=0.05		mg/L	
1398445 AMC	QC STANDARD	Total Mercury (Hg)	2007/11/05		100	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2007/11/05		102	%	80 - 120
	Method Blank	Total Mercury (Hg)	2007/11/05	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2007/11/05	NC		%	25
1398901 MLB	MATRIX SPIKE	Total Lead (Pb)	2007/11/06		98	%	80 - 120
	QC STANDARD	Total Lead (Pb)	2007/11/06		112	%	80 - 120
	Spiked Blank	Total Lead (Pb)	2007/11/06		87	%	80 - 120
	Method Blank	Total Lead (Pb)	2007/11/06	ND, RDL=0.05		mg/L	

ND = Not detected
 N/A = Not Applicable
 NC = Non-calculable
 RPD = Relative Percent Difference
 QC Standard = Quality Control Standard
 SPIKE = Fortified sample

Your P.O. #: NSD016300
Your Project #: 1028976/Z9100
Your C.O.C. #: B 45466

Attention: Paula Brennan
Jacques Whitford Limited
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/11/16

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A7C6454
Received: 2007/11/14, 17:30

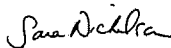
Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Mercury - Total (CVAA,LL)	1	N/A	2007/11/16	ATL SOP 00026 R2	Based on EPA245.1

Sample Matrix: Paint
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Moisture	1	N/A	2007/11/16	ATL SOP 00001 R2	MOE Handbook 1983
TCLP Inorganic extraction - pH	1	N/A	2007/11/16	4100_1_1	Based on EPA1311
TCLP Inorganic extraction - Weight	1	N/A	2007/11/16	4100_1_1	Based on EPA1311

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Sara Nicholson
16 Nov 2007 15:44:18 -04:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SHARLENE BAIRD, Project Manager
Email: sharlene.baird.reports@maxxamanalytics.com
Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A7C6454
Report Date: 2007/11/16

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name:
Your P.O. #: NSD016300
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Maxxam ID		V85904		
Sampling Date		2007/09/03		
COC Number		B 45466		
Registration #				
	Units	JW07-BHA-PS1	RDL	QC Batch

ELEMENTS				
Total Mercury (Hg)	ug/L	2.9	0.01	1406710

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7C6454
Report Date: 2007/11/16

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name:
Your P.O. #: NSD016300
Sampler Initials:

RESULTS OF ANALYSES OF PAINT

Maxxam ID		V85904		
Sampling Date		2007/09/03		
COC Number		B 45466		
Registration #				
	Units	JW07-BHA-PS1	RDL	QC Batch

INORGANICS				
Moisture	%	ND	5	1407046
Sample Weight (as received)	g	20	N/A	1406791
Initial pH	N/A	NA		1406789
Final pH	N/A	6.2		1406789
ND = Not detected RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: A7C6454
Report Date: 2007/11/16

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name:
Your P.O. #: NSD016300
Sampler Initials:

GENERAL COMMENTS

Sample V85904-01: Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.
Moisture value reported is a visual estimate for calculation purposes.

Results relate only to the items tested.

Jacques Whitford Limited
Attention: Paula Brennan
Client Project #: 1028976/Z9100
P.O. #: NSD016300
Project name:

Quality Assurance Report
Maxxam Job Number: DA7C6454

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1406710 SSI	MATRIX SPIKE	Total Mercury (Hg)	2007/11/16		103	%	N/A
	LEACH. BLANK	Total Mercury (Hg)	2007/11/16	ND, RDL=0.013		ug/L	
	QC STANDARD	Total Mercury (Hg)	2007/11/16		102	%	80 - 120
	Spiked Blank	Total Mercury (Hg)	2007/11/16		96	%	80 - 120
	Method Blank	Total Mercury (Hg)	2007/11/16	ND, RDL=0.013		ug/L	
	RPD	Total Mercury (Hg)	2007/11/16	NC		%	25
1406791 AMC	RPD	Sample Weight (as received)		TBA		%	N/A

ND = Not detected
N/A = Not Applicable
TBA = Result to follow
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample

Your P.O. #: NSD016400
Your Project #: 1028976/Z9100
Site: BAIE VERTE/RAMBLER
Your C.O.C. #: 12188

Attention: Paula Brennan
Jacques Whitford Limited
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2007/11/22

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A7C6759
Received: 2007/11/15, 10:59

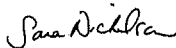
Sample Matrix: Leachate
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals Water Total OES - Partial Scan	2	N/A	2007/11/21	ATL SOP 00025 R3	Based on EPA200.7

Sample Matrix: Solid Waste
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Moisture	2	N/A	2007/11/16	ATL SOP 00001 R2	MOE Handbook 1983
TCLP Inorganic extraction - pH	2	N/A	2007/11/20	4100_1_1	Based on EPA1311
TCLP Inorganic extraction - Weight	2	N/A	2007/11/20	4100_1_1	Based on EPA1311

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Sara Nicholson
22 Nov 2007 11:16:22 -04:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SHARLENE BAIRD, Project Manager
Email: sharlene.baird.reports@maxxamanalytics.com
Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 1

Maxxam Job #: A7C6759
Report Date: 2007/11/22

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Maxxam ID		V87412		V87413		
Sampling Date		2007/11/08		2007/11/08		
COC Number		12188		12188		
Registration #						
	Units	JW07-ML-PS1	RDL	JW07-ML-PS24	RDL	QC Batch

Elements (ICP-OES)						
Total Lead (Pb)	mg/L	ND	0.5	0.2	0.1	1409998

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7C6759
Report Date: 2007/11/22

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

RESULTS OF ANALYSES OF SOLID WASTE

Maxxam ID		V87412	V87413		
Sampling Date		2007/11/08	2007/11/08		
COC Number		12188	12188		
Registration #					
	Units	JW07-ML-PS1	JW07-ML-PS24	RDL	QC Batch

INORGANICS					
Moisture	%	ND	ND	1	1406870
Sample Weight (as received)	g	50	44	N/A	1408973
Initial pH	N/A	NA	NA		1408970
Final pH	N/A	5.6	5.0		1408970

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A7C6759
Report Date: 2007/11/22

Jacques Whitford Limited
Client Project #: 1028976/Z9100
Project name: BAIE VERTE/RAMBLER
Your P.O. #: NSD016400
Sampler Initials:

GENERAL COMMENTS

Sample V87412-00: Lead: Elevated detection limit due to matrix interference.

Sample V87412-01: Moisture value reported is a visual estimate for calculation purposes.

Sample V87413-00: Lead: Elevated detection limit due to blank performance.

Sample V87413-01: Moisture value reported is a visual estimate for calculation purposes.

Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Results relate only to the items tested.

Jacques Whitford Limited
Attention: Paula Brennan
Client Project #: 1028976/Z9100
P.O. #: NSD016400
Project name: BAIE VERTE/RAMBLER

Quality Assurance Report
Maxxam Job Number: DA7C6759

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1409998	MLB	MATRIX SPIKE	Total Lead (Pb)	2007/11/21		93 %	80 - 120
		QC STANDARD	Total Lead (Pb)	2007/11/21		100 %	80 - 120
		Spiked Blank	Total Lead (Pb)	2007/11/21		88 %	80 - 120
		Method Blank	Total Lead (Pb)	2007/11/21	ND, RDL=0.05	mg/L	

ND = Not detected
QC Standard = Quality Control Standard
SPIKE = Fortified sample