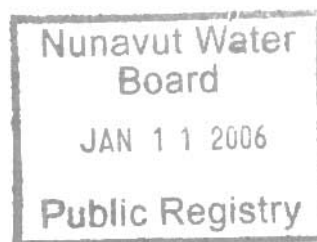




Final Report

***Former Navigational Aid and
Weather Station, Radio Island,
Nunavut***

***Environmental Site Delineation
and Material Inventory***



Final Report

**Former Navigational Aid and Weather
Station, Radio Island, Nunavut**

**Environmental Site Delineation and
Material Inventory**

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**FORMER NAVIGATIONAL AID AND WEATHER STATION
RADIO ISLAND, NUNAVUT
ENVIRONMENTAL SITE DELINEATION AND MATERIAL INVENTORY
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**FORMER NAVIGATIONAL AID AND WEATHER STATION
RADIO ISLAND, NUNAVUT**

ENVIRONMENTAL SITE DELINEATION AND MATERIAL INVENTORY

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EXECUTIVE SUMMARY

The Radio Island navigational beacon site is located to the southwest of Resolution Island, which itself is located to the southeast of Baffin Island, Nunavut. The site was set up by the Canadian Department of Transport as a navigational aid and weather station and it was used until 1961. The environmental site issues at Radio Island include former landfills and buildings as well as abandoned hazardous materials (lead paint, asbestos), and barrels.

Indian and Northern Affairs Canada (INAC) retained Environmental Services, Public Works and Government Services Canada (PWGSC) to design a remediation plan for the site at Radio Island. In order to complete the design, information gaps in the previous site assessment work needed to be identified and additional site assessment work was required. Earth Tech completed the field investigation portion of the project September 3, 2001. The field program included an investigation to delineate soil contamination, completion of an inventory of materials abandoned on the property, and an investigation for potential landfill sites, and borrows pit locations.

The following conclusions can be drawn from the environmental assessment that has been completed during September 2001 at the former Navigational Aid and Weather Station at Radio Island, Nunavut.

- The Radio Island site is remote and difficult to access. In the current condition it poses a small health and safety risk, and a moderate to high ecological risk.
- Metals contamination exceeding CCME-1999 criteria exists in a number of areas at the station. Contaminated soil volumes have been estimated using the laboratory and survey/sample data. Due to difficult access and time constraints during the site visit, not all areas within the long and narrow ravines were delineated for heavy metals. The volume of contaminated soils was estimated based on field observations which identified the location of the soils in the ravines and the location of the delineating bedrock ravine faces.
- Hydrocarbon soil contamination exceeding criteria has an estimated volume of 312 m³ in the vicinity of the former generator building and with a 25% contingency equates to approximately 400 m³.
- Soil contaminated with heavy metals exceeding CCME-1999 criteria exists in a number of areas at the station and totals approximately 800 m³. With a 25 % contingency applied this equates to approximately 1,100 m³.
- Hazardous and non-hazardous material has been identified and quantified to allow for disposal planning. The crushed volume of non-hazardous material is approximately 320 m³ and with a 25% contingency applied equates to 400 m³. The volume of hazardous material is approximately 10 m³ with a 25% contingency and rounded up equates to approximately 15 m³.
- Some soil sample locations may be classified as leachable hazardous waste due to very high lead and zinc concentrations in the investigation and delineation

samples. The estimated volume of leachable hazardous waste is approximately 6 m³ and with a 25 % contingency applied is approximately 8 m³.

- Areas for the landfilling of non-hazardous debris have been identified and no sources of natural borrow material were identified.
- A map with elevations and key ravine locations has been surveyed and will prove very useful for remediation project planning.

1.0 INTRODUCTION

1.1 Background Information

The Radio Island navigational beacon site is located to the southeast of Resolution Island, which itself is located to the southeast of Baffin Island, Nunavut. The location of Radio Island is presented in Figure 1.1. The site was set up by the Canadian Department of Transport as a navigational aid and weather station and it was used until 1961. The site is remote and is only accessible by helicopter or by boat during summer months. Boat access is only possible through a cove on the north shore and is susceptible to 10 m high tidal fluctuations. The site is situated at Lat 61°18'N, and Long 64°52' W.

The environmental site issues at Radio Island include former landfills and buildings as well as abandoned hazardous materials (lead paint, asbestos), and barrels. There was very little PCB containing equipment used on site and previous studies did not reveal levels of PCB's above the applied criteria. The site was primarily powered by coal brought in by ship, which greatly reduced the amount of fuel and barrels required on site.

1.2 Scope of Work and Objectives

As a result of the Treasury Board Federal Contaminated Sites Assessment Initiative (FCSAI), Indian and Northern Affairs Canada (INAC) is undertaking an environmental site assessment and remedial action plan design for the Radio Island site. The purpose of this undertaking was threefold:

1. To document facility, contaminant and physical site characteristics;
2. To finalize delineation of contamination (degree, nature, estimated extent and media affected) and site conditions (geological, hydrogeological and hydrological) so an effective remedial action plan can be developed; and
3. To develop a remedial design for the sites, complete with specifications, plans and a Class "D" cost estimate to undertake the work.

INAC has retained Environmental Services, Public Works and Government Services Canada (PWGSC) to design a remediation plan for the site at Radio Island. In order to complete the design, information gaps in the previous site assessment work needed to be identified and additional site assessment work was required. The Radio Island site was one of four sites completed on the site visit. The other three sites included in this project were, Padloping Island, Bear Island, and Cape Christian.

Earth Tech Canada Inc., formerly Reid Crowther, has prepared this report to complete the site assessment of the Radio Island abandoned military site in accordance with the Terms of Reference provided by PWGSC on August 2, 2001.

The scope of work that was proposed for this environmental assessment has been presented in Table 1.1 on the following page. The table is a brief overview of the detailed scope of work presented in the project Terms of Reference provided by PWGSC.

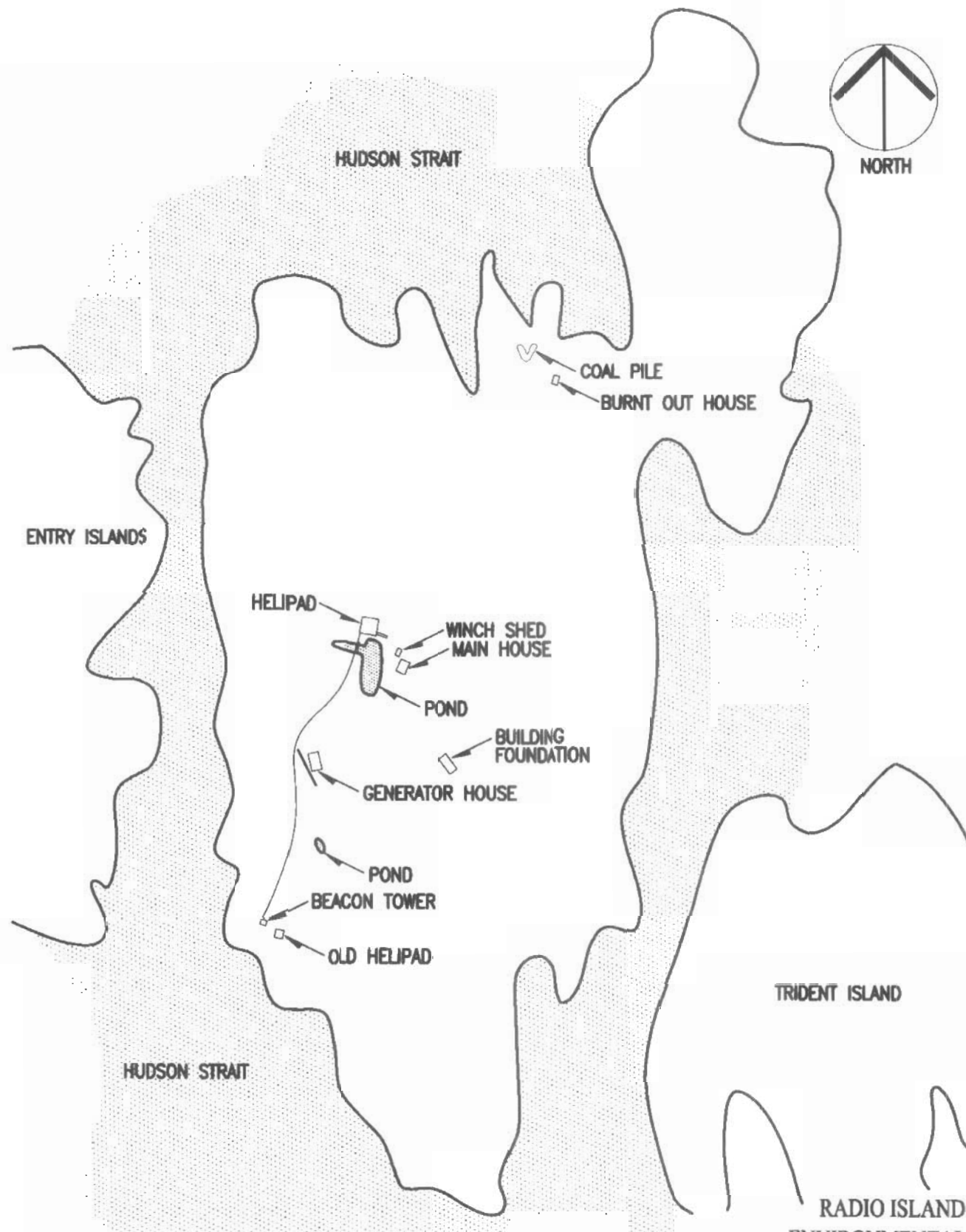


Table 1.1 Scope of Work Summary for Radio Island

Task	Scope of Work	Comments
1. Site Logistics	From Iqaluit travel to Radio Island by helicopter, return to Iqaluit.	Hire polar bear monitor from Iqaluit HTA.
2. Delineation of Impacted Areas	Areas in ESG report with analytical results showing exceedances to DCC I and DCC II criteria.	Areas are to be delineated for the specific parameter identified in the ESG report.
3. Quantify Non-Hazardous Debris	Quantify the volume of all non-hazardous debris with the view to on-site disposal. Includes remains of infrastructure, metal debris, empty barrels, equipment, and coal.	Due to lack of borrow material all debris may have to be removed from the island for disposal, possibly at Resolution Island.
4. Quantify Hazardous Debris	Quantify the volume of all hazardous debris with the view to removal and off-site disposal. Includes leachate toxic soil, batteries, panel containing asbestos.	Asbestos material can be bagged and landfilled on-site.
5. Site Drawings	Mark up existing available drawings and site plans to identify all features, buildings, equipment and areas.	Using a total station but not to produce detailed contour map.
6. Lab Analysis and Data Evaluation	Submit to CAEAL accredited laboratory the soil and liquid samples from Task 2 above. Data tabulation and evaluation.	
7. Prepare Draft Report	Prepare draft assessment report (two hard copies and two CD copies) for review by PWGSC and INAC.	Required by October 15, 2001.
8. Submit Final Report	Provide final report (5 hard copies and two CD copies) incorporating review comments.	Provide within two weeks of receipt of review comments from PWGSC and INAC.

1.3 Previous Environmental Investigations

The only previous environmental work completed on the site, was a 1996 report prepared by the Royal Military College, Environmental Sciences Group (ESG), "An Environmental Site Assessment of Radio Island, NWT".

This report was used as a template for gathering and compiling specific information on the Radio Island site. The ESG report provided the site history, sampling criteria, and background data needed to design the follow-up sampling program and site logistics.

The data in the ESG report indicated that samples and information were gathered during the field investigation program was not able to accurately delineate the extent of

contamination or provide a detailed inventory of materials on site. Hence, the need for an additional site visit for filling the information gaps and delineating the contamination that was identified in the ESG report.

1.4 Earth Tech Work Completed

Earth Tech completed the field investigation portion of the project September 3, 2001. The information gathered by Earth Tech will be used to prepare a remediation design and to prepare tender packages for the subsequent remediation of the site. An overall site plan showing site features is provided in Figure 1.2 and an elevation map prepared by Earth Tech is provided in pull-out format in Appendix A (Figure 1.3).

The field program included an investigation to delineate soil contamination, completion of an inventory of materials abandoned on the property, and an investigation for potential landfill sites and borrow pit locations.

1.5 Methodology

1.5.1 Soil Sampling

Soil sampling was completed by first reviewing the information in the ESG report and identifying the areas requiring delineation sampling. The team members responsible for delineation sampling identified and located the areas sampled by the ESG team in 1995 by conducting a short reconnaissance walk over of the site. This was somewhat of a challenge as the site plans were vague and not to scale. Most of the areas were found by looking for the identification tags and pegs installed by the ESG team. Many of the tags were still intact making locating the areas of concern a little easier. Tags that were missing had their respective areas located by matching descriptions in the report appendices to site features as well as site photographs.

Most of the soil sampling to be conducted on site involved delineation of heavy metals and hydrocarbon contamination. Heavy metals cannot readily be identified in soils by visual observation. The metals are usually carried or spread by oxidizing over time and being carried by surface or groundwater, or more commonly and rapidly, carried and spread by a solvent. At the Radio Island site many of the areas impacted with heavy metals were over grown with mosses and grasses within the narrow drainage pathways and any hydrocarbon staining associated with the heavy metal contamination could not be identified by visual observation.

Having identified/located the area to be sampled, a small shovel was used to retrieve the soil samples. This was particularly useful as many of the samples were beneath a thick blanket of arctic moss requiring removal much like cutting a household carpet and rolling it back. The sample shovel was cleaned with a small wire brush and wiped with a paper towel between sampling points to prevent cross contamination between sample locations.

The samples were placed in sealable plastic bags and labeled accordingly. Samples collected for hydrocarbons were placed in glass jars with Teflon-lined lids as soon as possible after retrieval to prevent volatilization of any light end hydrocarbons that may possibly remain in the sample. Upon departure from the island, samples from the site

were placed in ice pack filled coolers for preservation prior to transporting to the laboratory in Edmonton, Alberta. Prior to sealing the cooler for transport from Iqaluit to Edmonton, fresh ice packs replaced the original ice packs and a completed chain of custody/analytical request form was sealed in cooler for the courier south.

1.5.2 Product Sampling

No product was identified on the island and subsequently no liquid product samples were retrieved from the Radio Island site.

1.5.3 Asbestos Sampling

The Earth Tech team was equipped to sample asbestos with proper PPE and had a certified asbestos abatement person (Don Roy) on site should the need have arisen. No additional (or previously unidentified by ESG) asbestos containing material (ACM) was located and therefore no sampling was undertaken.

1.5.4 Paint Sampling

A single paint sample from the exterior of one of the buildings was retrieved while on site. A dedicated stainless steel putty knife/scrapper was used to remove the flecks of paint and placed in a sealable plastic bag.

1.5.5 Landfill and Borrow Pit Identification

The landfill and borrow pit areas were identified with the aid of the ESG report, general site reconnaissance, and the examination of potential areas by the Earth Tech project team. The landfill sites were chosen based on their distance from the ocean and/or on site freshwater receptors, accessibility, distance from the site and major debris concentrations, topography and gradient for the prevention of leachate passing through the buried debris, and accessibility to fill cover.

Borrow sites were not easily identified, as the island is very rugged with very little soil.

1.5.6 Site Survey

Procedures undertaken for the site survey initially included all team members walking through the site to examine the lay of the land, identify important structures and significant features, and correlate potential sampling locations with the ESG reports. Based on these findings, survey control points were laid out in key positions across the site to establish the grounds for an efficient survey. The site survey was performed by an experienced surveyor (Greg Farion) using a TOPCON GTS-212 total station and was assisted by a rod person. Where possible, a second rod person (taken from the sampling crew) was utilized to increase productivity of the survey. The survey scope for each individual site was based on the requirements in the request for proposal from PWGSC, as well as, any information considered to be of use to PWGSC for the cleanup of the sites. Data collected during the survey had descriptor codes attached based on typical Earth Tech coding. A field book was also kept of the survey, which supplemented most survey points with additional information and descriptions to be used in the office once the points were downloaded. At the completion of each day, data collected for that day

was downloaded and stored onto a lap top computer and imported into EMXS Acad (AutoCAD based earthwork program) to check for erroneous data and to plan for the next day's survey. This data was backed up on 3 1/2" floppy disk and protected in a waterproof bag. Upon return to the Edmonton Earth Tech office all four-site surveys were transferred from the laptop and site plans and supplemental drawings were created for the report.

1.5.7 EM Survey

Due to the rugged terrain of the island and most of the debris being trapped in low areas within drainage patterns, it was not practical to conduct an EM survey and subsequently was not included in the terms of reference for this project.

1.5.8 Petroflag and Enviroguard Field Tests

Due to time constraints, remoteness, and lack of available cargo space in the only available helicopter to transport the field crew to the site, the Petroflag and Enviroguard tests kits were not used to aid in the on site delineation.

1.5.9 Soil Volumes

Due to the lack of soil on site, volumes of impacted soil were determined based on the depth to granite bedrock. Soil samples for delineation were collected in areas identified in the ESG report and submitted for analytical testing. Once the laboratory data was reviewed, exceedances to the applied criteria were plotted on the site plan and a surface area was calculated. The average depth to bedrock then multiplied by the surface area to obtain a volume. Although the volume calculation itself is simple, several assumptions for the depth of contaminant needed to be made.

Several other extensive studies conducted in Arctic have shown that vertical subgrade mobility of hydrocarbons is somewhat limited by the active layer of permafrost and/or bedrock. There were only a few areas that appeared to be impacted by hydrocarbon contamination and it should be noted that hydrocarbons are typically the most common carrier of heavy metal contamination; some finite assumptions can be made as to the depth of heavy metals being limited by the same factors. The investigation at the Radio Island site was carried out near the time of year when the thickest layer of thawed soil is present. In most cases this provides an opportunity to investigate the depth of actual penetration in the soil, however due to the lack of soil at Radio Island, the depth of penetration is assumed to be bedrock.

The standard used for calculating depth of contaminants at Radio Island depended on the setting of the area being investigated. Very few impacted areas were broad or flat and most were consisted of drainage channels leading to lower elevations on the island. The pitch or sides of the drainage channels were also inconsistent in angle and width. This type of setting provided for typical impacted areas to be broader at the source, narrowing within the drainage pathways (sometimes to as little as 300 mm in width), and broadening again in low flat ponded areas. The soil volume for each area (described in detail in Section 2 of this report) is presented in brief below:

- Main Station Area, heavy metals and petroleum hydrocarbons were investigated in the areas around the buildings, former buildings, dumpsites, helipads, and mostly in drainage patterns and low areas. Soil was scarce in all locations. The assumed depth to bedrock is 0.5 m (maximum).
- Beach Area and Coal Off Loading Site, heavy metals and petroleum hydrocarbons were investigated in soil around these areas. There was a little more soil here at this elevation on the island (likely sedimentary accumulations due to erosion). The assumed depth to bedrock is 0.5 m.

It should be noted that sampling in the drainage channels was often treacherous as the inclination in the channels can be very steep. This limited and even restricted further sampling down gradient in some areas of the drainage channels. Due to no safe access, some delineation areas were calculated based on the length and width of the channel.

2.0 CONTAMINANT INVESTIGATION

2.1 Main Station Area

The area surrounding the main station area had the most samples collected by ESG in 1996. The majority of the samples were retrieved in small drainage ravines around the main house, winch shed, former powerhouse, and in areas where debris was discarded on the ground surface. The ravines and drainage patterns are typically low areas where debris was deposited. The ESG report determined that contaminated soils (typically heavy metals) were present in the waste filled ravines and was likely migrating through the local drainage patterns.

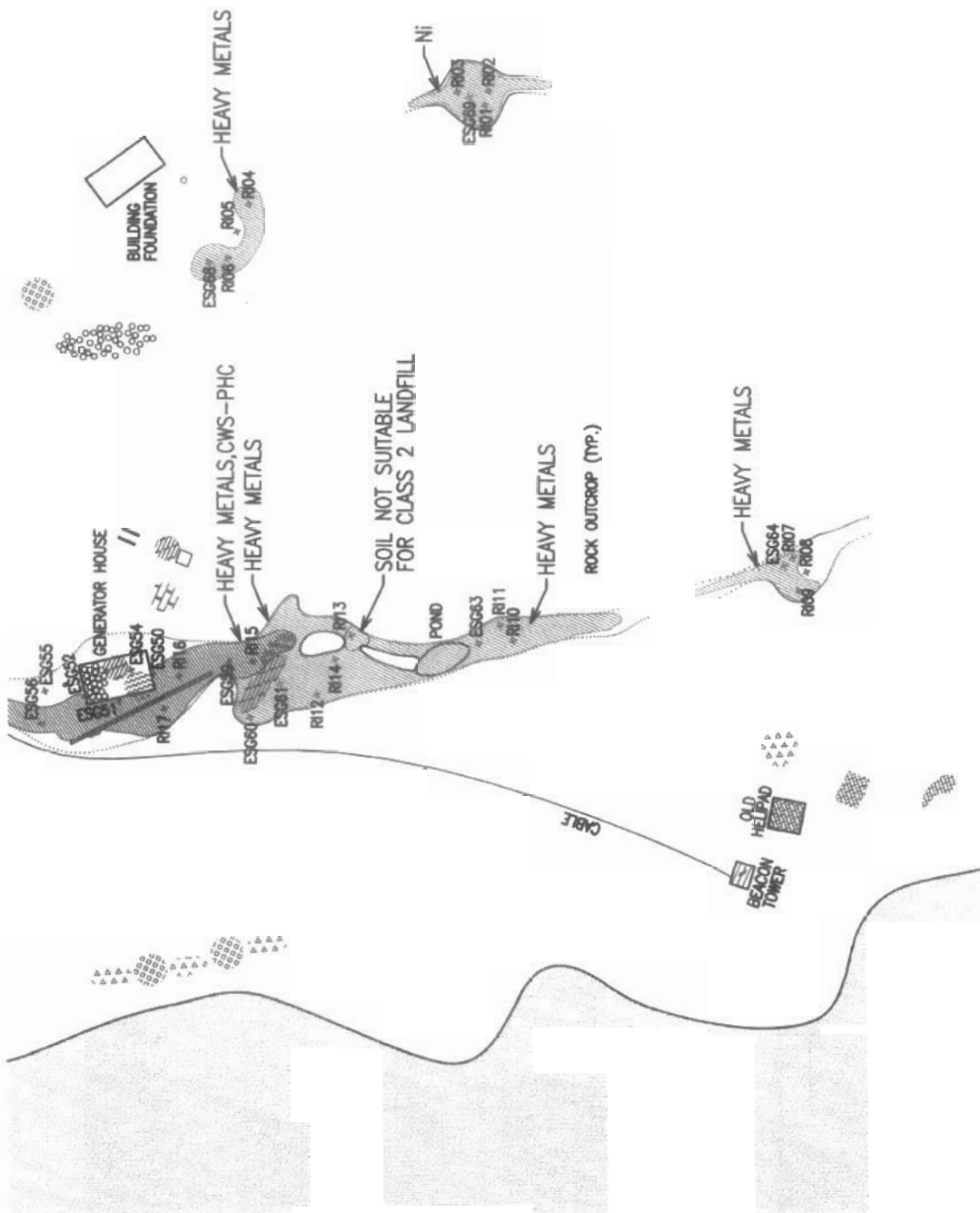
The ESG sample locations were assigned a four-digit number with a letter prefix and the sample point(s) for the location were identified with an ESG tag number. (i.e. G7508, Tag #9) Where possible, the ESG tags were located in the field and correlated to the site/location description in the report. Where the tags could not be located or there was no tag, the description provided in Appendix C of the ESG report was used to locate the sample area. The location of identified areas having exceedances and requiring delineation in the vicinity of the main station area is presented in Figure 2.0 (south half of site), and Figure 2.1 (north half of site).

Table 2.1.1 identifies the locations having exceedances in the ESG report and presents the subsequent delineation sampling results for these areas. Appendix B provides site and sample location photographs, and Appendix C presents a copy of the lab reports.

The data in Table 2.1.1 uses the same criteria presented in the ESG report however, since the ESG report was published, two new sets of relevant criteria have been published by the CCME. The first is the Canadian Environmental Soil Quality Guidelines, 1999, which presents updated scientifically defensible soil chemistry derived from the CCME 1991 Interim Canadian Environmental Quality Criteria for Contaminated Sites. The second set of newly published criteria is the Canada Wide Standards for Petroleum Hydrocarbons in Soil January 2001, (CWS-PHC). The CWS is a 3-tiered, risk-based, remedial standard developed for four generic land uses – agriculture, residential /parkland, commercial, and industrial. The CWS criteria applied to the Radio Island site is Residential/Parkland for coarse-grained soils between 0 and 1.5 m in depth.

The data presented in Table 2.1.1 indicates that there are exceedances outside of the ESG sampled areas and that delineation has been achieved in some areas. Table 2.1.2 briefly describes each site in the vicinity of the station area, and presents the results of the investigations conducted. Table 2.1.2 also provides an estimate as to the volume of impacted soil at each location. The sites are identified for location and delineation on Figures 2.0 and 2.1.

It should be noted that several sample locations across the site that were shown as exceedances in the ESG report did not exhibit exceedances in the Earth Tech 2001 sampling program when compared to the most recent CCME criteria. This indicates the impacted area identified in the ESG report has been delineated or is no longer an exceedance. These areas should be confirmed again for the presence of contamination exceeding the applicable criteria prior to undertaking costly remedial activities such as excavation.



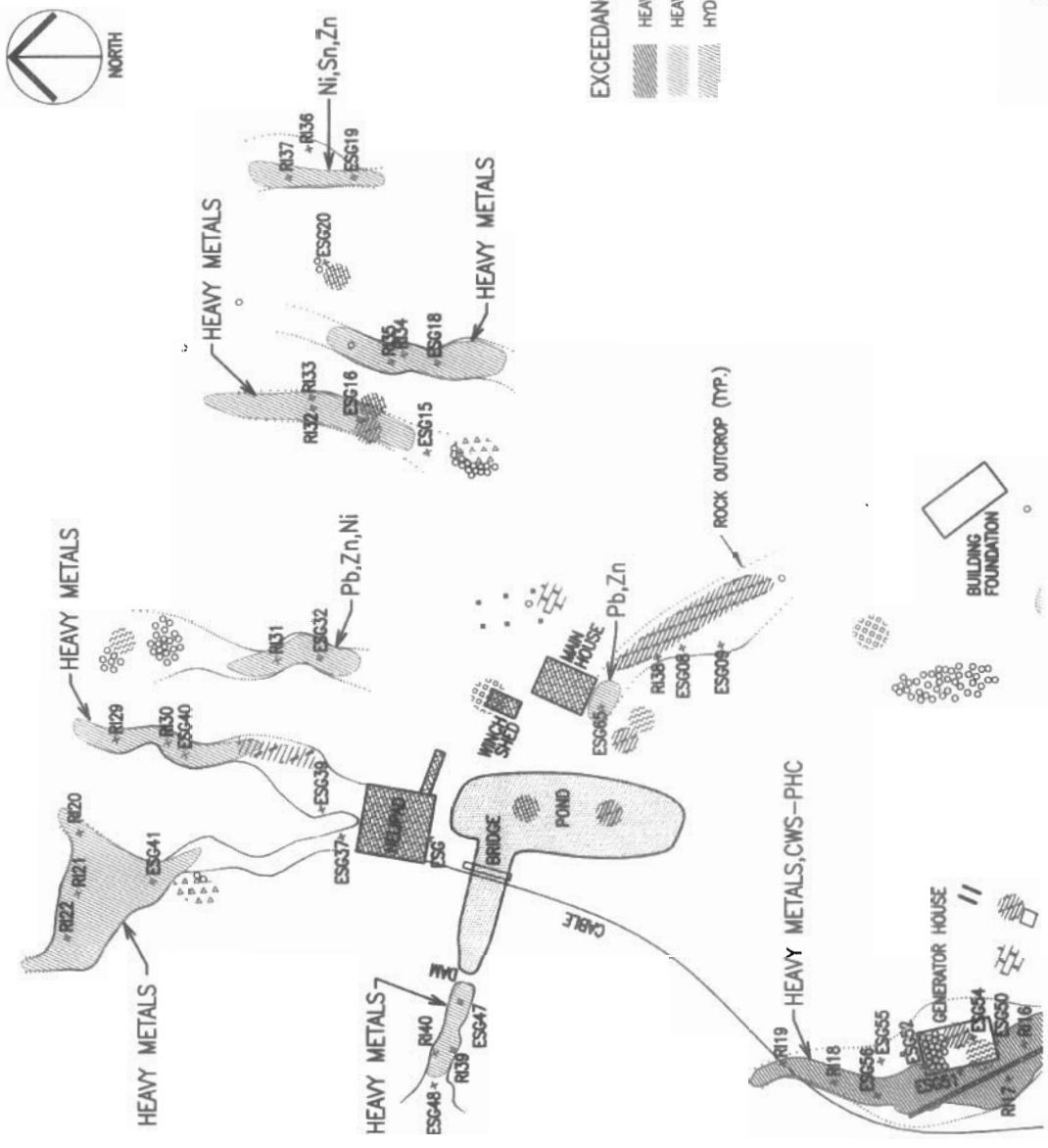
DEBRIS LEGEND

	ASBESTOS BOARD		BRICK		METAL
	BATTERIES		DOMESTIC GARBAGE		LEAD PIPE
	ELECTRICAL		WOOD		

EXCEEDANCES

	HEAVY METALS AND HYDROCARBONS
	HEAVY METALS
	HYDROCARBONS

RADIO ISLAND
MAIN STATION AREA SOUTH
SAMPLE LOCATIONS AND EXCEEDANCES
OCTOBER, 2001
SCALE: 1:750
FIGURE 2.0



EXCEEDANCES

- HEAVY METALS AND HYDROCARBONS
- HEAVY METALS
- HYDROCARBONS

DEBRIS LEGEND

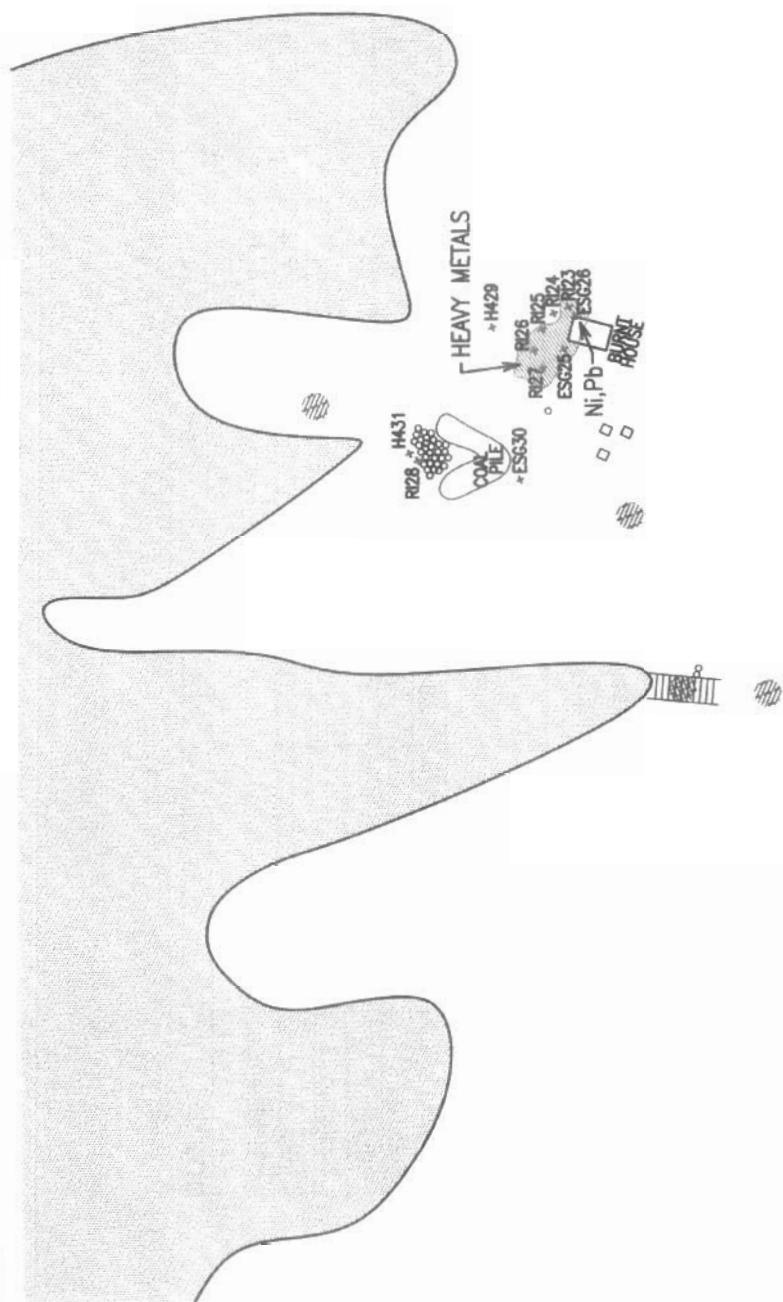
- ASBESTOS BOARD
- BATTERIES
- DOMESTIC GARBAGE
- ELECTRICAL
- BRICK
- LEAD PIPE
- METAL
- WOOD

RADIO ISLAND
MAIN STATION AREA NORTH
SAMPLE LOCATIONS AND EXCEEDANCES
OCTOBER, 2001
SCALE: 1:750
FIGURE 2.1



EXCEEDANCES

- HEAVY METALS AND HYDROCARBONS
- HEAVY METALS
- HYDROCARBONS



*ESC42



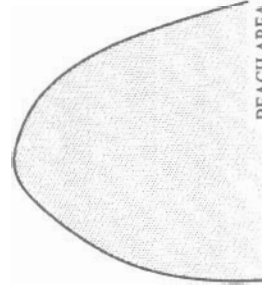
EARTH SYSTEMS
A tyco INTERNATIONAL LTD. COMPANY

DEBRIS LEGEND

- ASBESTOS BOARD
- BATTERIES
- DOMESTIC GARBAGE
- ELECTRICAL
- BRICK
- LEAD PIPE
- METAL
- WOOD

RADIO ISLAND
BEACH AREA and COAL OFF-LOADING SITE
SAMPLE LOCATIONS AND EXCEEDANCES

OCTOBER, 2001
SCALE: 1:750
FIGURE 2.2



**Table 2.1.1 Soil Samples
Summary of Laboratory Results
Radio Island, Main Station Area**

Parameter	Remediation Criteria	Gully South of Building Foundation					Southwest of Building Foundation					Gully East of Old Heli Pad				
		ESG - 69					ESG - 68					ESG - 64				
Metals		8474	RI-01	RI-02	RI-03	8473	RI-04	RI-05	RI-06	8469	RI-07	RI-08	RI-09			
Antimony	20						<2.0	<2.0	<2.0		<2.0	<2.0	3.2			
Arsenic	12	1.5				6.1	6.7	2.9	4.5	1.4	<0.7	3.6	<0.7			
Barium	500						39.4	48.9	147		58.2	31.8	120			
Beryllium	4						0.3	0.2	0.3		0.6	0.2	1.5			
Cadmium	10	<1.0				5.4	0.4	<0.2	1.4	<1.0	<0.2	<0.2	1.5			
Chromium	64	<20				<20	22.5	10.9	20.7	34	21.6	9.6	28.2			
Cobalt	50	18.8				90	11.3	7.4	87.6	116	60.5	8.7	107			
Copper	63	43				137	101	18.8	112	660	253	27.2	685			
Lead	140	14				620	42.6	4.5	150	84	8.8	3.4	1120			
Mercury	6.6						0.15	<0.05	0.76		<0.05	<0.05	2.59			
Molybdenum	10						3.3	<0.4	2.3		0.5	<0.4	1.5			
Nickel	50	105	120	167	231	84	70	27.1	99.3	840	382	43.5	801			
Selenium	3						1.3	<1.0	6.2		1.0	<1.0	2.7			
Silver	20						<1.0	<1.0	<1.0		<1.0	<1.0	<1.0			
Thallium	1						<1.0	<1.0	<1		<1.0	<1.0	<1.0			
Tin	50						93.2	<2.0	6.1		<2.0	<2.0	5.9			
Vanadium	130						27.0	16.6	33.7		27.6	15.1	32.5			
Zinc	200	189				1500	179	26	447	237	76.8	23.9	478			

BOLD Indicates exceedances to CCME Residential/Parkland Criteria.

Table 2.1.1 Soil Samples (Continued)
Summary of Laboratory Results
Radio Island, Main Station Area

Parameter	Remediation Criteria 1999 CCME Residential Parkland mg/kg	Ravine South of Generator House						
		ESG – 63			ESG - 61			
		8469	RI-10	RI-11	8466	RI-12	RI-13	RI-14
Metals								
Antimony	20		11.1	9.7		<2.0	254	56.6
Arsenic	12	1.4	7.5	3.5	7.4	2.6	4.9	6.5
Barium	500		215	110		168	85.4	244
Beryllium	4		0.2	0.2		0.3	0.1	0.3
Cadmium	10	<1.0	8.6	11.1	28	1	0.2	115
Chromium	64	3.4	9.6	14.1	<20	20.1	15.0	11.4
Cobalt	50	116	44.7	73.1	7.2	19.2	4.1	116
Copper	63	660	280	335	348	177	57.6	623
Lead	140	84	4030	2110	4100	527	115000	21200
Mercury	6.6		10.3	3.72		0.42	0.42	13.8
Molybdenum	10		4.5	3.9		0.9	1.3	4.4
Nickel	50	840	120	206	19.9	28.2	21.4	115
Selenium	3		7.6	6.9		2.7	2.0	9.6
Silver	20		<1.0	<1.0		<1.0	<1.0	<1.0
Thallium	1		<1.0	<1.0		<1.0	<1.0	<1.0
Tin	50		9.3	6.7		7.7	38.4	22.8
Vanadium	130		24.1	17.5		26.4	18.1	51.4
Zinc	200	237	1270	1450	3160	316	36.7	19500

BOLD Indicates exceedances to CCME Residential/Parkland Criteria.

Table 2.1.1 Soil Samples (Continued)
Summary of Laboratory Results
Radio Island, Main Station Area

Parameter	Remediation Criteria		Generator House				Generator House		Generator House			
	1999 CCME Residential Parkland mg/kg	CWS Res. Course-Grain Eco Soil Contact	ESG-59	8454	ESG - 50	8455	ESG-51	ESG - 52 & 56	8456	8460	RI-18	RI-19
Metals												
Antimony	20		148		3.7		4.0				10.2	<2.0
Arsenic	12		8.1	7.3	5.2	3.6	2.8		4.9	1.1	0.8	1.7
Barium	500		381		1120		679				138	175
Beryllium	4		0.4		0.5		0.2				0.3	0.3
Cadmium	10		7.2	10.2	1.2	3.9	4.4		8.4	1.0	0.9	1.7
Chromium (total)	64		29	8.1	8.0	63	21.5		45	28	27.3	27.1
Cobalt	50		14.7	6.0	11.4	8.9	4.6		11.2	9.3	9.1	21.0
Copper	63		354	141	148	880	407		560	67	48.4	71.5
Lead	140		18860	14000	11760	5380	2220		8300	247	793	196
Mercury	6.6			4.72	31.0		14.1				0.72	1.70
Molybdenum	10			3.5	1.0		0.5				0.6	1.2
Nickel	50		36	14.4	27	30	22.6		28	24	30.4	37.7
Selenium	3			2.4	<1.0		<1.0				<1.0	1.2
Silver	20			<1.0	<1.0		<1.0				<1.0	<1.0
Thallium	1			<1.0	<1.0		<1.0				<1.0	<1.0
Tin	50			44.3	102		43				2.6	2.1
Vanadium	130			27.2	15.8		13.5				34.9	34.6
Zinc	200		2720	1720	3980	3100	1240		6340	640	584	733
Hydrocarbons												
Benzene	0.5			<0.04	<0.04		<0.04				<0.04	<0.04
Toluene	3			<0.10	<0.15		<0.10				<0.10	<0.10
Ethylbenzene	5			<0.10	<0.10		<0.10				<0.10	<0.10
Xylenes	5			<0.20	<0.79		<0.20				<0.20	<0.20
F1, (C6-C10),		130		<10	<10		<10				<10	50
F2, (C10-C16)		450		<10	4100		3800				34	29000
F3, (C16-C34)		400		3500	30000		10000				590	20000
F4, (>C34)		2800		3500	15000		1700				120	1300

BOLD Indicates exceedances to CCME Residential/Parkland Criteria.

Table 2.1.1 Soil Samples (Continued)
Summary of Laboratory Results
Radio Island, Main Station Area

Parameter	Remediation Criteria	Northwest of Heli Pad			North of Heli Pad			Northeast of Heli Pad	
		ESG - 41			ESG - 40			ESG - 32	
	1999 CCME Residential Parkland mg/kg	8444	RI-20	RI-21	RI-22	8443	RI-29	RI-30	8434 RI-31
Metals									
Antimony	20		<2.0	<2.0	<2.0		8.8	<2.0	
Arsenic	12	53	3.6	10.8	7.2	16.1	44.5	4.1	2.6
Barium	500		37.9	41.1	251		644	768	36.4
Beryllium	4		0.3	0.2	<0.1		0.4	0.5	0.4
Cadmium	10	21	<0.2	14.4	6.7	3.8	4.5	0.3	<1.0
Chromium	64	59	14.2	3.2	25.5	55	54.3	52.9	22
Cobalt	50	27	13.8	29.0	188	15.3	21.1	17.1	8.9
Copper	63	222	28.6	71.4	70.8	243	1230	122	38
Lead	140	351	7.0	174	458	1700	2780	714	1340
Mercury	6.6		<0.05	0.72	2.12		14.1	1.35	0.08
Molybdenum	10		<0.4	10.1	8.3		7.4	1.7	<0.4
Nickel	50	117	66.5	87.6	110	76	94.6	165	24
Selenium	3		<1.0	7.6	6.6		9.7	1.6	<1.0
Silver	20		<1.0	<1.0	<1.0		40.0	2.4	<1.0
Thallium	1		<1.0	<1.0	<1.0		<1.0	<1.0	<1.0
Tin	50		<2.0	54.9	24.5		1700	66.7	<2.0
Vanadium	130		21.8	25.5	4.1		33.9	47.0	20.5
Zinc	200	5000	46.9	3580	1670	1440	1220	373	2260

BOLD Indicates exceedances to CCME Residential/Parkland Criteria.

Table 2.1.1 Soil Samples (Continued)
Summary of Laboratory Results
Radio Island, Main Station Area

	Remediation Criteria	South of Main House		West of Pond			Paint Sample From Main House
Parameter	1999 CCME Residential Parkland Mg/kg	ESG-65		ESG - 47			ESG - 41
		8470	RI-38	8450	RI-39	RI-40	RI-41
Metals							
Antimony	20				<2.0	<2.0	
Arsenic	12	6.4		8.4	7.6	6.0	
Barium	500				111	269	
Beryllium	4				0.9	0.5	
Cadmium	10	<1.0		8.7	1.0	1.2	
Chromium (total)	64	41		<20	39.4	10.6	
Cobalt	50	14.1		14.8	23.8	20.8	
Copper	63	45		191	67.5	94.6	
Lead	140	268	10.4	660	264	91.3	111000
Mercury	6.6				1.76	0.55	
Molybdenum	10				2.0	0.8	
Nickel	50	23		49	70.2	89.2	
Selenium	3				1.6	5.4	
Silver	20				< 1.0	< 1.0	
Thallium	1				<1.0	<1.0	
Tin	50				79.4	41.8	
Vanadium	130				28.2	8.9	
Zinc	200	274		9200	1160	924	

BOLD Indicates exceedances to CCME Residential/Parkland Criteria.

North of Former Generator House	G8456 and 8460, Tag # 52 and 56	RI-18 and RI-19	Exceedances of CCME-1999 for copper, lead, zinc, and CWS-PHC.	See Figure 2.0. This site is combined with several others due to drainage patterns in ravine.
Low Area North of Helipad	G8444, Tag # 41	RI-20, 21, and 22	Exceedances of CCME-1999 for Heavy Metals in all three delineation samples	140 m ³
Low Area/Ravine North of Helipad	G8443, Tag # 40	RI-29, and 30	Exceedances of CCME-1999 for arsenic, barium, copper, lead, mercury, nickel, selenium, tin and zinc for sample RI-29 and barium, copper, lead, nickel, tin and zinc for sample RI-30.	50 m ³
Low Area/Ravine Northeast of Helipad	G8434, Tag # 32	RI-31	No exceedances for Lead or Zinc in delineation sample. Exceedances for nickel exist.	40 m ³
Ravine Partially Filled with Debris Northeast of Main House	G8417, Tag # 16	RI-32 and 33	Exceedances of CCME-1999 for copper, lead, nickel and zinc in both samples and tin for sample RI-33.	70 m ³
Ravine East of Debris, Northeast of Main House	G8419, Tag # 18	RI-34 and 35	Exceedances of CCME-1999 for Copper, Lead, and Zinc in both samples and tin for sample RI-34.	65 m ³
Far East Ravine, Northeast of Main House	G8420, Tag # 19	RI-36 and 37	Exceedances of CCME-1999 for nickel, tin and zinc in sample RI-37.	30 m ³
Ravine Adjacent and South of Main House	G8470, Tag # 65	RI-38	No exceedances for Lead in delineation sample. G8470 exceeded CCME-1999.	12 m ³
Ravine Adjacent and West of Freshwater Pond	G8450, Tag # 47	RI-39 and RI-40	Exceedances of CCME-1999 for copper, nickel, lead, selenium and zinc in both samples. G8450 exceeded CCME-1999.	25 m ³
Total Soil Volume Exceeding CCME Metals Criteria				*750 m³/1000m³
Total Soil Volume Exceeding CCME CWS – PHC Criteria				*312 m³/400m³
Total Soil Volume Exceeding One Or More CCME Criteria (rounded up)				*1070 m³/1400m³

*Note: The first volume indicates the estimated volume of soil exceeding criteria and the second volume includes a 25% contingency.

2.2 Additional Sampling, Leachable Levels of Lead

During the preparation of the Radio Island report, the high levels of lead in select sample were discussed with PWGSC Project Manager, Chris Doupe. These high levels of lead may pose a concern and/or problem for future disposal due to their potential to leach out high levels of lead.

In order to classify the soil samples as hazardous or non-hazardous (requiring disposal in a Class 1 or Class 2 landfill respectively), three soil samples were chosen to represent the

2.3 Beach Area and Coal Off-Loading Site

The beach area on the north side of the island was used to unload supply ships of coal and supplies. The site consists of an old hut that has burned and collapsed, a coal stockpile area, and a winch location where the bags of coal were winched to the main site. There are also several barrels and small piles of debris on the ground surface in this area.

The barrel locations were investigated and sampled by ESG in 1996. The location of identified areas having exceedances and requiring delineation in the vicinity of the beach area is presented in Figure 2.2.

Table 2.3.1 on the following page identifies the locations having exceedances in the ESG report and presents the subsequent delineation sampling results for these areas. Appendix B provides site and sample location photographs, and Appendix C presents the laboratory reports.

The data in Table 2.3.1 uses the same criteria presented in the ESG report however, since the ESG report was published, two new sets of relevant criteria have been published by the CCME. The first is the Canadian Environmental Soil Quality Guidelines, 1999, which presents updated scientifically defensible soil chemistry derived from the CCME 1991 Interim Canadian Environmental Quality Criteria for Contaminated Sites. The second set of newly published criteria is the Canada Wide Standards for Petroleum Hydrocarbons in Soil January 2001, (CWS-PHC). The CWS is a 3-tiered, risk-based, remedial standard developed for four generic land uses – agriculture, residential/parkland, commercial, and industrial. The CWS criteria applied to the Radio Island Site is Residential/Parkland for course-grained soils between 0 and 1.5 m in depth.

The data presented in Table 2.3.1 indicates that there are exceedances outside of the ESG sampled areas and that delineation has been achieved in some areas. Table 2.3.2 below briefly describes each site in the vicinity of the beach area, and presents the results of the investigations conducted. Table 2.3.2 also provides an estimate as to the volume of impacted soil at each location. The sites are identified on Figure 2.2.

Table 2.3.2 Results of Delineation

Area Description	ESG Identifier	Earth Tech Sample #	Summary of Results	Estimated Volume
Former Beach Hut (Indicated as Burnt House on Figure 2.2)	G8428, Tag # 26 G8427, Tag # 25	RI-23, RI-24, RI-25, 26, and 27	Exceedances of CCME-1999 for copper, lead, nickel, selenium and zinc.	44 m ³
North of Coal Stockpile	No Tag	RI-28	No Exceedance of CWS-PHC.	0 m ³
Total Soil Volume Exceeding One Or More CCME Criteria (rounded up)				*50 m³/65m³

*Note: The first volume indicates the estimated volume of soil exceeding criteria and the second volume includes a 25% contingency.

3.0 MATERIALS AND DEBRIS INVENTORY

3.1 Non Hazardous Debris

A systematic and detailed inventory and volume estimate of non-hazardous material was completed for all areas of the Radio Island Navigational Aid and Weather Station. The purpose of this estimate is to allow for site remediation planning by establishing the volume of material to be landfilled on site, and to estimate the time and resources to accomplish this task.

The table below presents the results of this inventory, which was generally conducted south to north. The building volumes have been calculated based on building demolition. Photographs of these areas are located in Appendix B.

Table 3.1 Non Hazardous Debris Volume

Area	Description	Type of Non-Hazardous Debris	Volume	Photo
1	Former Helipad and Beacon Tower	Cables, metal structure, wood and domestic debris.	35 m ³	3.1
2	Vicinity of Former Power House on east and west sides and north south along ravine.	Concrete foundations, steel frame columns, trusses/beams; wooden sill foundation, concrete, C channels, metal debris, cable from helipad to tower site, and crushed barrels (70).	105 m ³	3.2
3	Vicinity of Main House on east and west sides and north south along ravines.	Concrete foundations, steel frame columns, trusses/beams, wooden foundation(s), concrete, C channels, metal debris, crushed barrels, wire cable, bricks wooden structures (helipad, hut, and winch shed), winch mechanism and motor, and submersed debris in pond and low areas.	130 m ³	3.3
4	Beach Hut and coals Stockpile	Metal from winch system, scrap metal from hut, wooden ladder/platform, cables, poles, wires, crushed barrels (30), and 26 m ³ of coal.	45 m ³	3.4
		Total Crushed Volume (rounded up)	*320 m³/400m³	

***NOTE: THE FIRST VOLUME INDICATES THE ESTIMATED VOLUME OF SOIL EXCEEDING CRITERIA AND THE SECOND VOLUME INCLUDES A 25% CONTINGENCY.**

4.0 POTENTIAL LANDFILL SITES AND BORROW AREAS

4.1 Potential Landfill Sites

The Earth Tech project team investigated potential landfill areas on Radio Island that were within a reasonable hauling distance for potential sites at which to landfill the non-hazardous physical debris during the site clean-up. As noted in the ESG report, the island is comprised of rugged bedrock with very little fine materials or flat areas.

As the island is comprised primarily of ravines and rock faces, the number of possible locations identified were few. Two potential sites were identified including:

- Site 1 – Natural depression in bedrock southeast of former building foundation.
- Site 2 – Freshwater pond/reservoir west of main house.

Site 1 – Natural depression in bedrock, is shown in Photo 4.1. This area is a low area that has ponded water collected in it. The depression is approximately 20 m in width, 25 m long, with rock face heights of approximately 3 m on average surrounding the depression. The natural depression in the bedrock is of low permeability as indicated by the ponded/standing water. Debris was observed submersed at the bottom of the natural depression.

This area is approximately 30 m to the southeast from a former building foundation. The proximity to clean up areas in the southern portion of the site makes the area a suitable choice for the land filling of crushed non-hazardous debris. The capacity of the site assuming debris placed to a depth of 3 m over an area of 20 m by 25 m is 1,500 m³.

Site 2 – Freshwater pond/reservoir west of the main house is shown in Photo 4.2. This is also a natural low area in the bedrock. The depression has a small dam located in the drainage channel/ravine to the west of the reservoir that served as control mechanism to control the height of water within the reservoir. There is a substantial amount of debris submersed at the bottom of this natural depression. It is believed the reservoir was a source of potable water for the site.

The reservoir has rock face walls on four sides and is very impermeable. The depth of the reservoir is an approximate depth of 4 m deep. This area is adjacent and west of the main house and is approximately 37 m long by 14 m wide. The capacity of the site assuming debris placed to a depth of 4 m over the area is 2,072 m³.

4.2 Borrow Material

The areas surveyed and sampled on Radio Island did not yield any signs of borrow material. This was also identified in the ESG report.

6.0 CLOSURE

The usage of this report is limited by the Standard Earth Tech Special Provisions-Environmental Site Services, which are attached as Appendix D to this report.

APPENDIX B
PHOTOGRAPHS

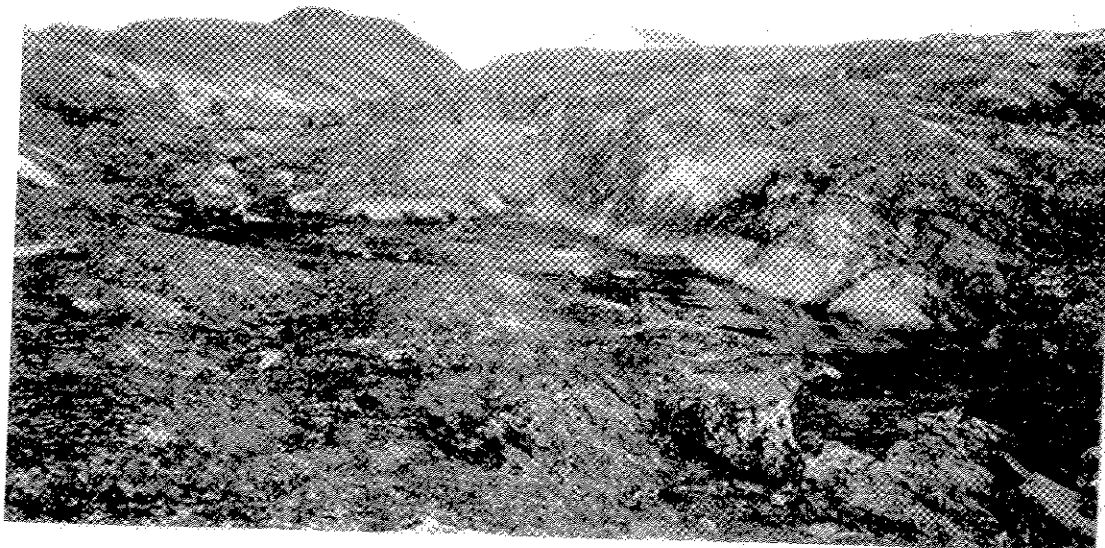


Photo 2.3 Facing north at location ESG-68 far background in ravine, RI-06 near sampler, RI-05 in middle and RI-04 on right.



Photo 2.4 Facing southeast at ESG-64 on far left, RI-09 left foreground, RI-07 centre and RI-08 on right near edge of water.

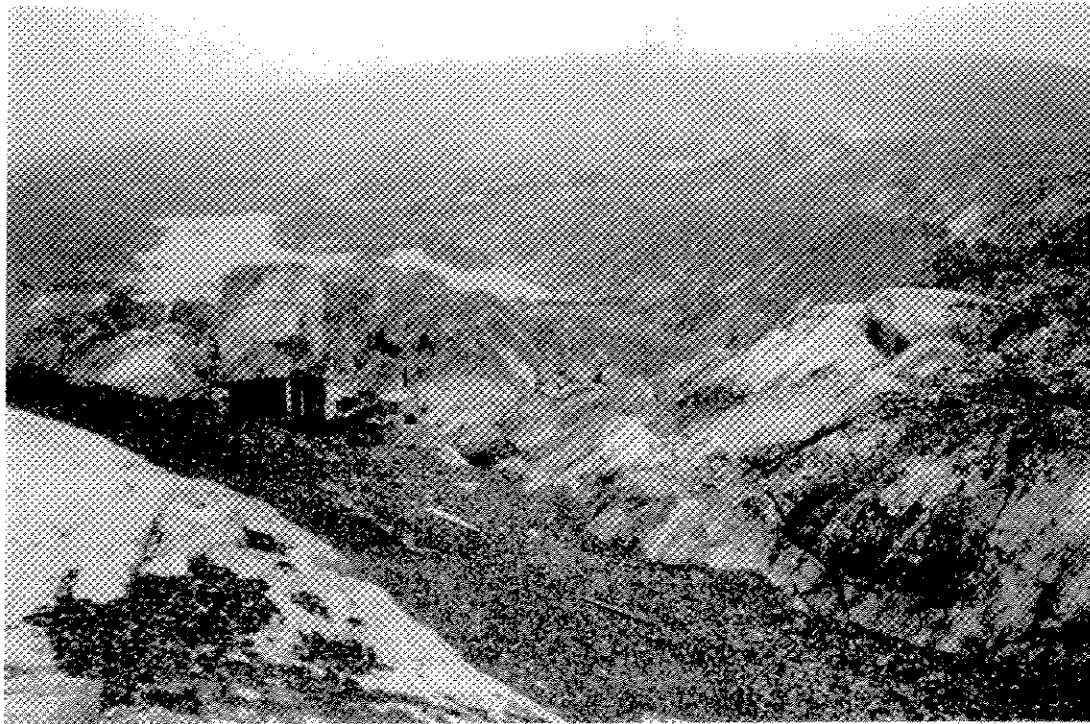


Photo 2.7 Facing south at ESG-59, right and foreground and RI-15 in center.



Photo 2.8 Facing northwest at ESG-50 along south wall of powerhouse. RI-16 (not shown) south of ESG-50.



Photo 2.11 Facing northeast at RI-19 near sample. Note main house, winch shed, freshwater pond, and helipad in background.



Photo 2.12 Facing southeast at low flat area northwest of helipad (background). From left RI-20, 21, 22. ESG-41 in slope/drainage pattern near barrel in background.



Photo 2.15 Facing north from sample location RI-31



Photo 2.16 Facing south at debris near ESG-16 with RI-33 and RI-32 in foreground.



Photo 2.17 Facing south at ESG-19 middle background and RI-36 on left and RI-37 on right.



Photo 2.18 Facing west along ravine on south side of main house. ESG-08 in foreground and ESG-65 in background.



Photo 2.19 Facing east up freshwater pond drainage ravine. ESG-47 in background near dam. RI-40 on left and RI-39 on right.



Photo 2.20 Facing east a freshwater pond dam and main house in background. Note ESG-47 near badly corroded battery



Photo 2.21 Facing south at main house where lead paint sample RI-41 was obtained.



Photo 2.22 Facing south at former beach hut/coal offloading area. ESG-H429 in foreground.



Photo 2.23 Facing south. RI-23 on left (multiple flags) ESG-26 centre, RI-24 right of ESG-26. ESG-25 visible near flag and RI-27 on far right.



Photo 2.24 Facing west towards coal pile and RI-28 on right.



Photo 3.1 Former helipad, beacon tower, and wood



Photo 3.2 Typical debris near former powerhouse

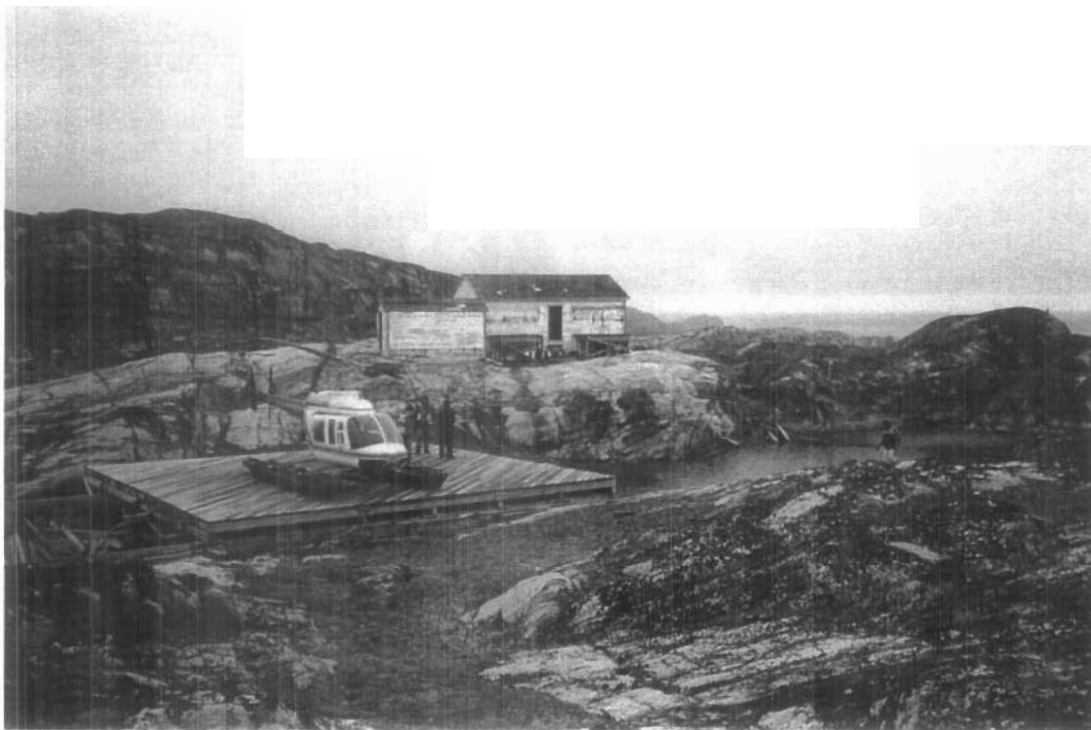


Photo 3.3 Facing east at helipad on concrete foundation. Winch shed and main house in background.



Photo 3.4 Former beach hut debris with coal and barrels in background



Photo 3.5 Damaged batteries.



Photo 3.6 Submersed debris and battery



Photo 4.1 Facing southeast across former building foundation. Natural low area in bedrock is pond in background.



Photo 4.2 Facing southeast at freshwater pond/reservoir west of main house. Reservoir already has a substantial amount of debris in it

APPENDIX C

LAB DATA



ANALYTICAL SERVICES

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Certificate of Analysis

9619 42 Avenue
Edmonton, Alberta
Canada T6E 5R2
Tel 780 465 1212
Fax 780 450 4187

Reported To :

PWGSC - ENVIRONMENTAL

Client Code PG

1000 - 9700 JASPER AVE
EDMONTON, AB
T5J 4E2

Attention : WILL WAWNYCHUK
Phone : (780) 497-3892
FAX : (780) 497-3842

Project Information :

Project ID : 19340-01 RADIO ISLAND
Submitted By: DON ROY

Requisition Forms :

Form 42012479 shipped on 05-Sep-01 received on 07-Sep-01 logged on 7-Sep-01 completed on 18-Sep-01
Form 42112479 shipped on 05-Sep-01 received on 07-Sep-01 logged on 7-Sep-01 completed on 27-Sep-01
Form 42212479 shipped on 05-Sep-01 received on 07-Sep-01 logged on 7-Sep-01 completed on 27-Sep-01
Form 42312479 shipped on 05-Sep-01 received on 07-Sep-01 logged on 7-Sep-01 completed on 18-Sep-01

Remarks :

- + All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- + 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- + Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- + Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- + All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- + This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Maureen Brown



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLANDPhilip ID : 31011562 31011563 31011564 31011565
Client ID : RI-01 RI-02 RI-03 RI-04

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	--	--	---	4940
Sb-TIR03	Antimony	ug/g	2.0	---	---	---	< 2.0
As-TIR03	Arsenic	ug/g	0.7	---	---	---	6.7
Ba-TIR03	Barium	ug/g	0.2	---	---	---	39.4
Be-TIR03	Beryllium	ug/g	0.1	---	---	---	0.3
Bi-TIR03	Bismuth	ug/g	10	---	---	---	< 10
B--TIR03	Boron	ug/g	10	---	---	---	< 10
Cd-TIR03	Cadmium	ug/g	0.2	---	---	---	0.4
Ca-TIR03	Calcium	ug/g	20	---	---	---	1390
Cr-TIR03	Chromium	ug/g	0.2	---	---	---	22.5
Co-TIR03	Cobalt	ug/g	0.3	---	---	---	11.3
Cu-TIR03	Copper	ug/g	0.5	---	---	---	101
EX994288	Dry & Grind	date		---	---	---	01/09/10
Fe-TIR03	Iron	ug/g	10	---	---	---	32800
Pb-TIR03	Lead	ug/g	2.0	---	---	---	42.6
Li-TIR03	Lithium	ug/g	0.1	---	---	---	7.7
Mg-TIR03	Magnesium	ug/g	10	---	---	---	2490
Mn-TIR03	Manganese	ug/g	0.2	---	---	---	113
Hg-T200M	Mercury	ug/g	0.05	---	---	---	0.15
Mo-TIR03	Molybdenum	ug/g	0.4	---	---	---	3.3
Ni-TIR03	Nickel	ug/g	0.8	120	167	231	70.0
P--TIR03	Phosphorus Total (P)	ug/g	4.0	---	---	---	325
K--TIR03	Potassium	ug/g	20	---	---	---	1060
Se-TIR03	Selenium	ug/g	1.0	---	---	---	1.3
Ag-TIR03	Silver	ug/g	1.0	---	---	---	< 1.0
Na-TIR03	Sodium	ug/g	10	---	---	---	105
Sr-TIR03	Strontium	ug/g	0.1	---	---	---	7.8
S--TIR03	Sulphur	ug/g	20	---	---	---	490
Te-TIR03	Tellurium	ug/g	5.0	---	---	---	< 5.0
Tl-T200G	Thallium	ug/g	1.0	---	---	---	< 1.0
Sn-TIR03	Tin	ug/g	2.0	---	---	---	93.2
Ti-TIR03	Titanium	ug/g	0.3	---	---	---	330
U--TIR03	Uranium	ug/g	5.0	---	---	---	< 5.0
V--TIR03	Vanadium	ug/g	0.4	---	---	---	27.0
Zn-TIR03	Zinc	ug/g	0.5	---	---	---	179
Zr-TIR03	Zirconium	ug/g	0.5	---	---	---	< 0.5

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011566 31011567 31011568 31011569
Client ID : RI-05 RI-06 RI-07 RI-08

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	3800	9420	13600	3690
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	< 2.0	< 2.0	< 2.0
As-TIR03	Arsenic	ug/g	0.7	2.9	4.5	< 0.7	3.6
Ba-TIR03	Barium	ug/g	0.2	48.9	147	58.2	31.8
Be-TIR03	Beryllium	ug/g	0.1	0.2	0.3	0.6	0.2
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	< 10	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	< 0.2	1.4	< 0.2	< 0.2
Ca-TIR03	Calcium	ug/g	20	133000	5990	3490	129000
Cr-TIR03	Chromium	ug/g	0.2	10.9	20.7	21.6	9.6
Co-TIR03	Cobalt	ug/g	0.3	7.4	87.6	60.5	8.7
Cu-TIR03	Copper	ug/g	0.5	18.8	112	253	27.2
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	9600	26000	14600	8460
Pb-TIR03	Lead	ug/g	2.0	4.5	150	8.8	3.4
Li-TIR03	Lithium	ug/g	0.1	7.0	8.7	10.2	6.9
Mg-TIR03	Magnesium	ug/g	10	22900	3930	4860	20600
Mn-TIR03	Manganese	ug/g	0.2	336	1160	409	275
Hg-T200M	Mercury	ug/g	0.05	< 0.05	0.76	< 0.05	< 0.05
Mo-TIR03	Molybdenum	ug/g	0.4	< 0.4	2.3	0.5	< 0.4
Ni-TIR03	Nickel	ug/g	0.8	27.1	99.3	382	43.5
P--TIR03	Phosphorus Total (P)	ug/g	4.0	322	1040	466	324
K--TIR03	Potassium	ug/g	20	946	1560	1360	890
Se-TIR03	Selenium	ug/g	1.0	< 1.0	6.2	1.0	< 1.0
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	140	288	255	135
Sr-TIR03	Strontium	ug/g	0.1	105	30.6	14.1	114
S--TIR03	Sulphur	ug/g	20	200	1900	363	230
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	< 2.0	6.1	< 2.0	< 2.0
Ti-TIR03	Titanium	ug/g	0.3	181	309	389	159
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	16.6	33.7	27.6	15.1
Zn-TIR03	Zinc	ug/g	0.5	26.1	447	76.8	23.9
Zr-TIR03	Zirconium	ug/g	0.5	1.0	< 0.5	< 0.5	0.8

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011570 31011571 31011572 31011573
Client ID : RI-09 RI-10 RI-11 RI-12

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	31900	4240	3240	5480
Sb-TIR03	Antimony	ug/g	2.0	3.2	11.1	9.7	< 2.0
As-TIR03	Arsenic	ug/g	0.7	< 0.7	7.5	3.5	2.6
Ba-TIR03	Barium	ug/g	0.2	120	215	110	168
Be-TIR03	Beryllium	ug/g	0.1	1.5	0.2	0.2	0.3
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	13	< 10	14	< 10
Cd-TIR03	Cadmium	ug/g	0.2	1.5	8.6	11.1	1.0
Ca-TIR03	Calcium	ug/g	20	3890	6130	9010	2580
Cr-TIR03	Chromium	ug/g	0.2	28.2	9.6	14.1	20.1
Co-TIR03	Cobalt	ug/g	0.3	107	44.7	73.1	19.2
Cu-TIR03	Copper	ug/g	0.5	685	280	335	177
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	17700	14200	12600	11900
Pb-TIR03	Lead	ug/g	2.0	1120	4030	2110	527
Li-TIR03	Lithium	ug/g	0.1	12.4	2.0	2.9	6.0
Mg-TIR03	Magnesium	ug/g	10	4310	1350	2250	3760
Mn-TIR03	Manganese	ug/g	0.2	317	568	907	235
Hg-T200M	Mercury	ug/g	0.05	2.59	10.3	3.72	0.42
Mo-TIR03	Molybdenum	ug/g	0.4	1.5	4.5	3.9	0.9
Ni-TIR03	Nickel	ug/g	0.8	801	120	206	28.2
P--TIR03	Phosphorus Total (P)	ug/g	4.0	792	1310	881	389
K--TIR03	Potassium	ug/g	20	1770	505	861	1610
Se-TIR03	Selenium	ug/g	1.0	4.2	7.6	6.9	2.7
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	268	234	264	234
Sr-TIR03	Strontium	ug/g	0.1	28.7	35.3	53.3	20.3
S--TIR03	Sulphur	ug/g	20	1610	3210	2120	697
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	5.9	9.3	6.7	7.7
Ti-TIR03	Titanium	ug/g	0.3	533	79.4	114	540
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	32.5	24.1	17.5	26.4
Zn-TIR03	Zinc	ug/g	0.5	478	1270	1450	316
Zr-TIR03	Zirconium	ug/g	0.5	0.7	< 0.5	< 0.5	< 0.5

Matrix : Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011574 31011575 31011576 31011577
Client ID : RI-13 RI-14 RI-15 RI-16

Sparcode	Parameter	Unit	MDL				
PHYSICAL							
00250760	Moisture	%(W/W)	0.3	---	---	26.7	17.2
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	3100	5070	6370	3770
Sb-TIR03	Antimony	ug/g	2.0	254	56.6	148	3.7
As-TIR03	Arsenic	ug/g	0.7	4.9	6.5	8.1	5.2
Ba-TIR03	Barium	ug/g	0.2	85.4	244	381	1120
Be-TIR03	Beryllium	ug/g	0.1	0.1	0.3	0.4	0.5
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	< 10	14	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	0.2	115	7.2	1.2
Ca-TIR03	Calcium	ug/g	20	1010	8190	8050	11300
Cr-TIR03	Chromium	ug/g	0.2	15.0	11.4	8.1	8.0
Co-TIR03	Cobalt	ug/g	0.3	4.1	116	6.0	4.6
Cu-TIR03	Copper	ug/g	0.5	57.6	623	141	148
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	7020	4170	13400	15600
Pb-TIR03	Lead	ug/g	2.0	115000	21200	14000	2880
Li-TIR03	Lithium	ug/g	0.1	2.9	2.6	8.8	8.1
Mg-TIR03	Magnesium	ug/g	10	1400	1450	1060	2550
Mn-TIR03	Manganese	ug/g	0.2	174	107	3100	570
Hg-T200M	Mercury	ug/g	0.05	0.42	13.8	4.72	31.0
Mo-TIR03	Molybdenum	ug/g	0.4	1.3	4.4	3.5	1.0
Ni-TIR03	Nickel	ug/g	0.8	21.4	115	14.4	15.5
P--TIR03	Phosphorus Total (P)	ug/g	4.0	496	1060	817	949
K--TIR03	Potassium	ug/g	20	830	554	454	511
Se-TIR03	Selenium	ug/g	1.0	2.0	9.6	2.4	< 1.0
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	216	305	250	201
Sr-TIR03	Strontium	ug/g	0.1	16.9	52.2	147	119
S--TIR03	Sulphur	ug/g	20	15200	13700	810	753
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	38.4	22.8	44.3	102
Ti-TIR03	Titanium	ug/g	0.3	357	109	152	232
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	18.1	51.4	27.2	15.8

Matrix : Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011574 31011575 31011576 31011577
Client ID : RI-13 RI-14 RI-15 RI-16

Sparcode	Parameter	Unit	MDL				
Zn-TIR03	Zinc	ug/g	0.5	36.7	19500	1720	3980
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date		---	---	01/09/17	01/09/17
EX995170	Volat. Soil Extract.	date		---	---	01/09/08	01/09/08
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	---	---	< 10	< 10
HCl-CALC	CCME PHC F1-BTEX	ug/g		---	---	< 10	< 10
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	---	---	< 10	4100
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	---	---	3500	30000
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	---	---	3500	15000
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	---	---	No	No
GHH--TOT	PHC GHH	ug/g	100	---	---	19000	74000
GHHs-MIN	PHC GHH SILICAGEL	ug/g	100	---	---	11000	56000
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.04	---	---	< 0.04	< 0.04
T001PT12	Toluene	ug/g	0.10	---	---	< 0.10	0.15
B021PT12	Ethylbenzene	ug/g	0.10	---	---	< 0.10	< 0.10
X003PT12	m+p - Xylene	ug/g	0.10	---	---	< 0.10	0.59
X002PT12	o - Xylene	ug/g	0.10	---	---	< 0.10	0.20
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	---	---	97	98
VS03PT12	d8-Toluene	%	0	---	---	100	99
Ed10PT12	Ethylbenzene-d10	%	60	---	---	65	73

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011578 31011579 31011580 31011581
Client ID : RI-17 RI-18 RI-19 RI-20

Sparcode	Parameter	Unit	MDL				
PHYSICAL							
00250760	Moisture	%(W/W)	0.3	10.6	16.7	30.8	---
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	3700	7890	7700	5030
Sb-TIR03	Antimony	ug/g	2.0	4.0	10.2	< 2.0	< 2.0
As-TIR03	Arsenic	ug/g	0.7	2.8	0.8	1.7	3.6 (1)
Ba-TIR03	Barium	ug/g	0.2	679	138	175	37.9
Be-TIR03	Beryllium	ug/g	0.1	0.2	0.3	0.3	0.3
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B-TIR03	Boron	ug/g	10	< 10	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	4.4	0.9	1.7	< 0.2
Ca-TIR03	Calcium	ug/g	20	3380	2380	2700	91000
Cr-TIR03	Chromium	ug/g	0.2	21.5	27.3	27.1	14.2
Co-TIR03	Cobalt	ug/g	0.3	4.6	9.1	21.0	13.8
Cu-TIR03	Copper	ug/g	0.5	407	48.4	71.5	28.6
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	10900	12600	9570	11900
Pb-TIR03	Lead	ug/g	2.0	2220	793	196	7.0
Li-TIR03	Lithium	ug/g	0.1	6.3	12.9	12.2	8.7
Mg-TIR03	Magnesium	ug/g	10	2340	4600	4910	20700
Mn-TIR03	Manganese	ug/g	0.2	407	90.8	34.3	390
Hg-T200M	Mercury	ug/g	0.05	14.1	0.72	1.70	< 0.05
Mo-TIR03	Molybdenum	ug/g	0.4	0.5	0.6	1.2	< 0.4
Ni-TIR03	Nickel	ug/g	0.8	22.6	30.4	37.7	66.5
P-TIR03	Phosphorus Total (P)	ug/g	4.0	643	342	379	422
K-TIR03	Potassium	ug/g	20	684	1670	1910	1050
Se-TIR03	Selenium	ug/g	1.0	< 1.0	< 1.0	1.2	< 1.0
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	220	307	315	148
Sr-TIR03	Strontium	ug/g	0.1	31.8	15.6	20.8	83.0
S-TIR03	Sulphur	ug/g	20	871	294	1440	226
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	43.0	2.6	2.1	< 2.0
Ti-TIR03	Titanium	ug/g	0.3	379	710	687	240
U-TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V-TIR03	Vanadium	ug/g	0.4	13.5	34.9	34.6	21.8

Matrix : Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLANDPhilip ID : 31011578 31011579 31011580 31011581
Client ID : RI-17 RI-18 RI-19 RI-20

Sparcode	Parameter	Unit	MDL				
Zn-TIR03	Zinc	ug/g	0.5	1240	584	733	46.9
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	1.3
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date		01/09/17	01/09/17	01/09/17	---
EX995170	Volat. Soil Extract.	date		01/09/08	01/09/08	01/09/08	---
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	< 10	< 10	50	---
HC1-CALC	CCME PHC F1-BTEX	ug/g		< 10	< 10	50	---
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	3800	34	29000	---
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	10000	590	20000	---
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	1700	120	1300	---
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	Yes	Yes	Yes	---
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.04	< 0.04	< 0.04	< 0.04	---
T001PT12	Toluene	ug/g	0.10	< 0.10	< 0.10	< 0.10	---
B021PT12	Ethylbenzene	ug/g	0.10	< 0.10	< 0.10	< 0.10	---
X003PT12	m+p - Xylene	ug/g	0.10	< 0.10	< 0.10	< 0.10	---
X002PT12	o - Xylene	ug/g	0.10	< 0.10	< 0.10	< 0.10	---
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	95	96	103	---
VS03PT12	d8-Toluene	%	0	102	98	100	---
Ed10PT12	Ethylbenzene-d10	%	60	84	73	67	---

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

Result comments and/or text results :

(1) DUPLICATES DO NOT MATCH FOR ARSENIC DUE TO NON-HOMOGENEOUS SAMPLE



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLANDPhilip ID : 31011582 31011583 31011584 31011585
Client ID : RI-21 RI-22 RI-23 RI-24

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	1430	752	---	---
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	< 2.0	---	---
As-TIR03	Arsenic	ug/g	0.7	10.8	7.2	---	---
Ba-TIR03	Barium	ug/g	0.2	41.1	251	---	---
Be-TIR03	Beryllium	ug/g	0.1	0.2	< 0.1	---	---
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	---	---
B--TIR03	Boron	ug/g	10	< 10	< 10	---	---
Cd-TIR03	Cadmium	ug/g	0.2	14.4	6.7	---	---
Ca-TIR03	Calcium	ug/g	20	5680	4340	---	---
Cr-TIR03	Chromium	ug/g	0.2	3.2	25.5	---	---
Co-TIR03	Cobalt	ug/g	0.3	29.0	188	---	---
Cu-TIR03	Copper	ug/g	0.5	71.4	70.8	---	---
EX994288	Dry & Grind	date		01/09/10	01/09/10	---	---
Fe-TIR03	Iron	ug/g	10	9690	65200	---	---
Pb-TIR03	Lead	ug/g	2.0	174	458	184	31.4
Li-TIR03	Lithium	ug/g	0.1	0.7	0.6	---	---
Mg-TIR03	Magnesium	ug/g	10	592	908	---	---
Mn-TIR03	Manganese	ug/g	0.2	99.9	5020	---	---
Hg-T200M	Mercury	ug/g	0.05	0.72	2.12	---	---
Mo-TIR03	Molybdenum	ug/g	0.4	10.1	8.3	---	---
Ni-TIR03	Nickel	ug/g	0.8	87.6	110	---	---
P--TIR03	Phosphorus Total (P)	ug/g	4.0	918	3640	---	---
K--TIR03	Potassium	ug/g	20	110	130	---	---
Se-TIR03	Selenium	ug/g	1.0	7.6	6.6	---	---
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	---	---
Na-TIR03	Sodium	ug/g	10	153	222	---	---
Sr-TIR03	Strontium	ug/g	0.1	24.6	23.3	---	---
S--TIR03	Sulphur	ug/g	20	5230	3490	---	---
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	---	---
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	---	---
Sn-TIR03	Tin	ug/g	2.0	54.9	24.5	---	---
Ti-TIR03	Titanium	ug/g	0.3	22.7	15.8	---	---
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	---	---
V--TIR03	Vanadium	ug/g	0.4	25.5	4.1	---	---
Zn-TIR03	Zinc	ug/g	0.5	3580	1670	---	---
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	---	---

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/04 16:00 01/09/04 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011586 31011587 31011588 31011589
Client ID : RI-25 RI-26 RI-27 RI-28

Sparcode	Parameter	Unit	MDL				
STRGDONE	Storage Charge	Y/N	Yes	..	---	Yes	
PHYSICAL							
00250760	Moisture	%(W/W)	0.3	..	---	17.5	
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	6600	6520	5210	---
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	< 2.0	< 2.0	---
As-TIR03	Arsenic	ug/g	0.7	2.9	3.9	2.0	---
Ba-TIR03	Barium	ug/g	0.2	43.2	79.0	117	---
Be-TIR03	Beryllium	ug/g	0.1	0.4	0.5	0.7	---
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	---
B-TIR03	Boron	ug/g	10	< 10	< 10	< 10	---
Cd-TIR03	Cadmium	ug/g	0.2	0.6	4.5	3.8	---
Ca-TIR03	Calcium	ug/g	20	8160	9770	4700	---
Cr-TIR03	Chromium	ug/g	0.2	25.7	19.4	13.6	---
Co-TIR03	Cobalt	ug/g	0.3	11.2	8.3	5.8	---
Cu-TIR03	Copper	ug/g	0.5	34.4	73.3	53.1	---
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	---
Fe-TIR03	Iron	ug/g	10	14900	17400	8460	---
Pb-TIR03	Lead	ug/g	2.0	79.1	207	168	---
Li-TIR03	Lithium	ug/g	0.1	8.3	8.2	7.9	---
Mg-TIR03	Magnesium	ug/g	10	6080	3000	1770	---
Mn-TIR03	Manganese	ug/g	0.2	533	177	124	---
Hg-T200M	Mercury	ug/g	0.05	0.35	0.96	1.83	---
Mo-TIR03	Molybdenum	ug/g	0.4	0.5	< 0.4	1.0	---
Ni-TIR03	Nickel	ug/g	0.8	52.4	47.8	22.3	---
P-TIR03	Phosphorus Total (P)	ug/g	4.0	674	2740	1050	---
K-TIR03	Potassium	ug/g	20	991	759	561	---
Se-TIR03	Selenium	ug/g	1.0	1.5	3.9	2.1	---
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	---
Na-TIR03	Sodium	ug/g	10	171	215	242	---
Sr-TIR03	Strontium	ug/g	0.1	16.2	46.3	79.5	---
S-TIR03	Sulphur	ug/g	20	580	1390	577	---
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	---
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	---
Sn-TIR03	Tin	ug/g	2.0	7.3	17.4	14.7	---
Ti-TIR03	Titanium	ug/g	0.3	235	172	131	---
U-TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	---

Matrix : Soil
Sampled on: 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLANDPhilip ID : 31011586 31011587 31011588 31011589
Client ID : RI-25 RI-26 RI-27 RI-28

Sparcode	Parameter	Unit	MDL				
V--TIR03	Vanadium	ug/g	0.4	25.4	23.0	17.5	---
Zn-TIR03	Zinc	ug/g	0.5	139	466	344	---
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	---
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date		---	---	---	01/09/17
EX995170	Volat. Soil Extract.	date		---	---	---	01/09/08
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	---	---	---	< 10
HC1-CALC	CCME PHC F1-BTEX	ug/g		---	---	---	< 10
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	---	---	---	< 10
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	---	---	---	< 10
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	---	---	---	< 10
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	---	---	---	Yes
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.04	---	---	---	< 0.04
T001PT12	Toluene	ug/g	0.10	---	---	---	< 0.10
B021PT12	Ethylbenzene	ug/g	0.10	---	---	---	< 0.10
X003PT12	m+p - Xylene	ug/g	0.10	---	---	---	< 0.10
X002PT12	o - Xylene	ug/g	0.10	---	---	---	< 0.10
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	---	---	---	94
VS03PT12	d8-Toluene	%	0	---	---	---	97
Ed10PT12	Ethylbenzene-d10	%	60	---	---	---	75

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011590 31011591 31011592 31011593
Client ID : RI-29 RI-30 RI-31 RI-32

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	5690	10200	5850	4570
Sb-TIR03	Antimony	ug/g	2.0	8.8	< 2.0	< 2.0	3.2
As-TIR03	Arsenic	ug/g	0.7	44.5	4.1	2.7	4.1
Ba-TIR03	Barium	ug/g	0.2	644	768	36.4	262
Be-TIR03	Beryllium	ug/g	0.1	0.4	0.5	0.4	0.4
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	12	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	4.5	0.3	< 0.2	3.9
Ca-TIR03	Calcium	ug/g	20	7430	3370	5180	6940
Cr-TIR03	Chromium	ug/g	0.2	54.3	52.9	15.4	18.8
Co-TIR03	Cobalt	ug/g	0.3	21.2	17.1	18.4	21.9
Cu-TIR03	Copper	ug/g	0.5	1230	122	34.7	136
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	81900	19600	11900	14400
Pb-TIR03	Lead	ug/g	2.0	2780	714	8.0	521
Li-TIR03	Lithium	ug/g	0.1	6.4	16.7	9.3	6.3
Mg-TIR03	Magnesium	ug/g	10	2070	5670	4540	2690
Mn-TIR03	Manganese	ug/g	0.2	242	46.8	394	715
Hg-T200M	Mercury	ug/g	0.05	14.1	1.35	0.08	3.35
Mo-TIR03	Molybdenum	ug/g	0.4	7.4	1.7	< 0.4 (1)	1.2
Ni-TIR03	Nickel	ug/g	0.8	94.6	165	72.6	53.4
P--TIR03	Phosphorus Total (P)	ug/g	4.0	5870	1120	453	2940
K--TIR03	Potassium	ug/g	20	692	2200	1130	870
Se-TIR03	Selenium	ug/g	1.0	9.7	1.6	< 1.0	1.7
Ag-TIR03	Silver	ug/g	1.0	40.0	2.4	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	323	455	144	196
Sr-TIR03	Strontium	ug/g	0.1	73.6	28.2	11.9	60.8
S--TIR03	Sulphur	ug/g	20	3830	904	230	875
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	1700	66.7	< 2.0 (2)	47.5
Ti-TIR03	Titanium	ug/g	0.3	204	683	228	189
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	33.9	47.0	20.5	18.5
Zn-TIR03	Zinc	ug/g	0.5	1220	373	94.9	837
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Result comments and/or text results :

- (1) DUPLICATES DO NOT MATCH FOR MOLYBDENUM DUE TO NON-HOMOGENEOUS SAMPLE
- (2) DUPLICATES DO NOT MATCH FOR TIN DUE TO NON-HOMOGENEOUS SAMPLE



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011594 31011595 31011596 31011597
Client ID : RI-33 RI-34 RI-35 RI-36

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	5150	4880	4400	4080
Sb-TIR03	Antimony	ug/g	2.0	2.2	< 2.0	< 2.0	< 2.0
As-TIR03	Arsenic	ug/g	0.7	4.4	5.4	4.0	3.1
Ba-TIR03	Barium	ug/g	0.2	250	273	122	39.5
Be-TIR03	Beryllium	ug/g	0.1	0.4	0.6	0.3	0.2
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	< 10	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	4.4	1.4	2.9	< 0.2
Ca-TIR03	Calcium	ug/g	20	8370	12700	49300	89600
Cr-TIR03	Chromium	ug/g	0.2	20.0	14.0	15.8	12.7
Co-TIR03	Cobalt	ug/g	0.3	42.7	8.6	6.8	7.2
Cu-TIR03	Copper	ug/g	0.5	172	131	86.6	22.4
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	14200	11200	14900	10400
Pb-TIR03	Lead	ug/g	2.0	507	442	218	3.8
Li-TIR03	Lithium	ug/g	0.1	7.3	7.5	6.7	6.7
Mg-TIR03	Magnesium	ug/g	10	2510	2500	11700	21700
Mn-TIR03	Manganese	ug/g	0.2	791	281	312	308
Hg-T200M	Mercury	ug/g	0.05	5.75	1.98	< 0.05	< 0.05
Mo-TIR03	Molybdenum	ug/g	0.4	1.0	1.1	0.6	< 0.4
Ni-TIR03	Nickel	ug/g	0.8	51.5	30.7	29.2	27.6
P--TIR03	Phosphorus Total (P)	ug/g	4.0	4170	5660	1390	332
K--TIR03	Potassium	ug/g	20	768	663	758	918
Se-TIR03	Selenium	ug/g	1.0	2.3	1.1	1.0	< 1.0
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	293	367	247	162
Sr-TIR03	Strontium	ug/g	0.1	65.8	88.5	79.3	103
S--TIR03	Sulphur	ug/g	20	869	588	465	265
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	50.6	56.6	22.8	< 2.0
Ti-TIR03	Titanium	ug/g	0.3	178	165	148	179
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	18.2	19.9	17.1	17.2
Zn-TIR03	Zinc	ug/g	0.5	924	519	718	25.6
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	0.5

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00 01/09/04 16:00



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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL

Project : 19340-01 RADIO ISLAND

Philip ID : 31011598

Client ID : RI-37

31011599

RI-38

31011600

RI-39

31011601

RI-40

Sparcode	Parameter	Unit	MDL				
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	8210	---	8580	3680
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	---	< 2.0	< 2.0
As-TIR03	Arsenic	ug/g	0.7	11.4	---	7.6	6.0
Ba-TIR03	Barium	ug/g	0.2	50.6	---	111	269
Be-TIR03	Beryllium	ug/g	0.1	0.4	---	0.9	0.5
Bi-TIR03	Bismuth	ug/g	10	< 10	---	< 10	< 10
B--TIR03	Boron	ug/g	10	14	---	< 10	11
Cd-TIR03	Cadmium	ug/g	0.2	0.3	---	1.0	1.2
Ca-TIR03	Calcium	ug/g	20	2160	---	8840	15400
Cr-TIR03	Chromium	ug/g	0.2	25.0	---	39.4	10.6
Co-TIR03	Cobalt	ug/g	0.3	13.8	---	23.8	20.8
Cu-TIR03	Copper	ug/g	0.5	62.0	---	67.5	94.6
EX994288	Dry & Grind	date		01/09/10	---	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	38600	---	44800	14500
Pb-TIR03	Lead	ug/g	2.0	25.9	10.4	264	91.3
Li-TIR03	Lithium	ug/g	0.1	10.5	---	11.1	1.9
Mg-TIR03	Magnesium	ug/g	10	4500	---	8600	2660
Mn-TIR03	Manganese	ug/g	0.2	127	---	613	408
Hg-T200M	Mercury	ug/g	0.05	0.05	---	1.76	0.55
Mo-TIR03	Molybdenum	ug/g	0.4	1.0	---	2.0	0.8
Ni-TIR03	Nickel	ug/g	0.8	64.4	---	70.2	89.2
P--TIR03	Phosphorus Total (P)	ug/g	4.0	572	---	4390	1070
K--TIR03	Potassium	ug/g	20	1680	---	1080	429
Se-TIR03	Selenium	ug/g	1.0	1.1	---	1.6	5.4
Ag-TIR03	Silver	ug/g	1.0	< 1.0	---	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	150	---	188	225
Sr-TIR03	Strontium	ug/g	0.1	9.5	---	401	120
S--TIR03	Sulphur	ug/g	20	616	---	702	1950
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	---	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	---	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	228	---	79.4	48.1
Ti-TIR03	Titanium	ug/g	0.3	438	---	1010	198
U--TIR03	Uranium	ug/g	5.0	< 5.0	---	< 5.0	< 5.0
V--TIR03	Vanadium	ug/g	0.4	37.3	---	28.2	8.9
Zn-TIR03	Zinc	ug/g	0.5	282	---	1160	924
Zr-TIR03	Zirconium	ug/g	0.5	1.0	---	< 0.5	< 0.5

Matrix : Soil

Sampled on: 01/09/04 16:00

Soil

01/09/04 16:00

Soil

01/09/04 16:00

Soil

01/09/04 16:00



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Client : PWGSC - ENVIRONMENTAL
Project : 19340-01 RADIO ISLAND

Philip ID : 31011602
Client ID : RI-41

Sparcode	Parameter	Unit	MDL	
METALS TOTAL				
Pb-TIR05	Lead	ug/g	10	111000 (1)

Matrix : Others
Sampled on: 01/09/04 16:00

Result comments and/or text results :

(1) SPIKE RECOVERY LOW FOR LEAD DUE TO MATRIX INTERFERENCE



ANALYTICAL SERVICES

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DUPLICATE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Nickel	RI-01	31011562	120	128	0.8	ug/g	-6.45
Silver	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Aluminum	RI-20	31011581	5030	4840	10	ug/g	3.85
Arsenic	RI-20	31011581	3.6	2.9	0.7	ug/g	21.54
Boron	RI-20	31011581	< 10	< 10	10	ug/g	0.00
Barium	RI-20	31011581	37.9	37.6	0.2	ug/g	0.79
Beryllium	RI-20	31011581	0.3	0.3	0.1	ug/g	0.00
Bismuth	RI-20	31011581	< 10	< 10	10	ug/g	0.00
Calcium	RI-20	31011581	91000	81600	20	ug/g	10.89
Cadmium	RI-20	31011581	< 0.2	< 0.2	0.2	ug/g	0.00
Cobalt	RI-20	31011581	13.8	13.5	0.3	ug/g	2.20
Chromium	RI-20	31011581	14.2	14.1	0.2	ug/g	0.71
Copper	RI-20	31011581	28.6	27.6	0.5	ug/g	3.56
Iron	RI-20	31011581	11900	11600	10	ug/g	2.55
Potassium	RI-20	31011581	1050	996	20	ug/g	5.28
Lithium	RI-20	31011581	8.7	8.5	0.1	ug/g	2.33
Magnesium	RI-20	31011581	20700	21000	10	ug/g	-1.44
Manganese	RI-20	31011581	390	370	0.2	ug/g	5.26
Molybdenum	RI-20	31011581	< 0.4	< 0.4	0.4	ug/g	0.00
Sodium	RI-20	31011581	148	138	10	ug/g	6.99
Nickel	RI-20	31011581	66.5	65.8	0.8	ug/g	1.06
Phosphorus Total (P)	RI-20	31011581	422	359	4.0	ug/g	16.13
Lead	RI-20	31011581	7.0	6.7	2.0	ug/g	4.38
Sulphur	RI-20	31011581	226	205	20	ug/g	9.74
Antimony	RI-20	31011581	< 2.0	< 2.0	2.0	ug/g	0.00
Selenium	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Tin	RI-20	31011581	< 2.0	< 2.0	2.0	ug/g	0.00
Strontium	RI-20	31011581	83.0	74.5	0.1	ug/g	10.79
Tellurium	RI-20	31011581	< 5.0	< 5.0	5.0	ug/g	0.00
Titanium	RI-20	31011581	240	238	0.3	ug/g	0.84
Uranium	RI-20	31011581	< 5.0	< 5.0	5.0	ug/g	0.00
Vanadium	RI-20	31011581	21.8	21.2	0.4	ug/g	2.79
Zinc	RI-20	31011581	46.9	46.3	0.5	ug/g	1.29
Zirconium	RI-20	31011581	1.3	1.2	0.5	ug/g	8.00
Thallium	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Mercury	RI-20	31011581	< 0.05	< 0.05	0.05	ug/g	0.00
Silver	RI-31	31011592	< 1.0	< 1.0	1.0	ug/g	0.00
Aluminum	RI-31	31011592	5850	5310	10	ug/g	9.68



ANALYTICAL SERVICES

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DUPLICATE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Arsenic	RI-31	31011592	2.7	3.1	0.7	ug/g	-13.79
Boron	RI-31	31011592	< 10	< 10	10	ug/g	0.00
Barium	RI-31	31011592	36.4	34.0	0.2	ug/g	6.82
Beryllium	RI-31	31011592	0.4	0.4	0.1	ug/g	0.00
Bismuth	RI-31	31011592	< 10	< 10	10	ug/g	0.00
Calcium	RI-31	31011592	5180	5220	20	ug/g	-0.77
Cadmium	RI-31	31011592	< 0.2	< 0.2	0.2	ug/g	0.00
Cobalt	RI-31	31011592	18.4	18.2	0.3	ug/g	1.09
Chromium	RI-31	31011592	15.4	14.3	0.2	ug/g	7.41
Copper	RI-31	31011592	34.7	34.0	0.5	ug/g	2.04
Iron	RI-31	31011592	11900	11600	10	ug/g	2.55
Potassium	RI-31	31011592	1130	1010	20	ug/g	11.21
Lithium	RI-31	31011592	9.3	8.9	0.1	ug/g	4.40
Magnesium	RI-31	31011592	4540	4190	10	ug/g	8.02
Manganese	RI-31	31011592	394	396	0.2	ug/g	-0.51
Molybdenum	RI-31	31011592	< 0.4	0.7	0.4	ug/g	-54.55
Sodium	RI-31	31011592	144	139	10	ug/g	3.53
Nickel	RI-31	31011592	72.6	72.2	0.8	ug/g	0.55
Phosphorus Total (P)	RI-31	31011592	453	424	4.0	ug/g	6.61
Lead	RI-31	31011592	8.0	8.1	2.0	ug/g	-1.24
Sulphur	RI-31	31011592	230	227	20	ug/g	1.31
Antimony	RI-31	31011592	< 2.0	< 2.0	2.0	ug/g	0.00
Selenium	RI-31	31011592	< 1.0	< 1.0	1.0	ug/g	0.00
Tin	RI-31	31011592	< 2.0	3.7	2.0	ug/g	-59.65
Strontium	RI-31	31011592	11.9	12.8	0.1	ug/g	-7.29
Tellurium	RI-31	31011592	< 5.0	< 5.0	5.0	ug/g	0.00
Titanium	RI-31	31011592	228	215	0.3	ug/g	5.87
Uranium	RI-31	31011592	< 5.0	< 5.0	5.0	ug/g	0.00
Vanadium	RI-31	31011592	20.5	20.7	0.4	ug/g	-0.97
Zinc	RI-31	31011592	94.9	87.6	0.5	ug/g	8.00
Zirconium	RI-31	31011592	< 0.5	< 0.5	0.5	ug/g	0.00
Thallium	RI-31	31011592	< 1.0	< 1.0	1.0	ug/g	0.00
Mercury	RI-31	31011592	0.08	0.07	0.05	ug/g	13.33
Lead	RI-41	31011602	111000	93600	10	ug/g	17.01



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SPIKE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Nickel	RI-01	31011562	120	248	125	ug/g	103
Nickel	Blank Spike. Batch :	14201922	< 0.8	247	250	ug/g	99
Silver	Blank Spike. Batch :	14201958	< 1.0	59.1	62.5	ug/g	94
Aluminum	Blank Spike. Batch :	14201958	< 10	258	250	ug/g	103
Arsenic	Blank Spike. Batch :	14201958	< 0.7	475	500	ug/g	95
Boron	Blank Spike. Batch :	14201958	< 10	253	250	ug/g	101
Barium	Blank Spike. Batch :	14201958	< 0.2	246	250	ug/g	98
Beryllium	Blank Spike. Batch :	14201958	< 0.1	263	250	ug/g	105
Bismuth	Blank Spike. Batch :	14201958	< 10	252	250	ug/g	101
Calcium	Blank Spike. Batch :	14201958	< 20	248	250	ug/g	98
Cadmium	Blank Spike. Batch :	14201958	< 0.2	253	250	ug/g	101
Cobalt	Blank Spike. Batch :	14201958	< 0.3	246	250	ug/g	98
Chromium	Blank Spike. Batch :	14201958	0.8	244	250	ug/g	97
Copper	Blank Spike. Batch :	14201958	< 0.5	241	250	ug/g	96
Iron	Blank Spike. Batch :	14201958	< 10	255	250	ug/g	100
Potassium	Blank Spike. Batch :	14201958	< 20	1190	1250	ug/g	95
Lithium	Blank Spike. Batch :	14201958	0.2	243	250	ug/g	97
Magnesium	Blank Spike. Batch :	14201958	< 10	249	250	ug/g	99
Manganese	Blank Spike. Batch :	14201958	< 0.2	247	250	ug/g	99
Molybdenum	Blank Spike. Batch :	14201958	< 0.4	242	250	ug/g	97
Sodium	Blank Spike. Batch :	14201958	< 10	247	250	ug/g	97
Nickel	Blank Spike. Batch :	14201958	< 0.8	244	250	ug/g	98
Phosphorus Total (P)	Blank Spike. Batch :	14201958	< 4.0	1110	1250	ug/g	88
Lead	Blank Spike. Batch :	14201958	3.3	486	500	ug/g	96
Antimony	Blank Spike. Batch :	14201958	< 2.0	521	500	ug/g	104
Selenium	Blank Spike. Batch :	14201958	< 1.0	248	250	ug/g	99
Tin	Blank Spike. Batch :	14201958	< 2.0	1210	1250	ug/g	97
Strontium	Blank Spike. Batch :	14201958	< 0.1	245	250	ug/g	98
Titanium	Blank Spike. Batch :	14201958	0.3	249	250	ug/g	99
Uranium	Blank Spike. Batch :	14201958	< 5.0	256	250	ug/g	101
Vanadium	Blank Spike. Batch :	14201958	< 0.4	249	250	ug/g	99
Zinc	Blank Spike. Batch :	14201958	0.7	250	250	ug/g	100
Zirconium	Blank Spike. Batch :	14201958	< 0.5	241	250	ug/g	96
Mercury	Blank Spike. Batch :	14201965	< 0.05	0.10	.1	ug/g	96
Thallium	Blank Spike. Batch :	14201909	< 1.0	73.0	75	ug/g	97
Silver	Blank Spike. Batch :	14201943	< 1.0	60.7	62.5	ug/g	97
Aluminum	Blank Spike. Batch :	14201943	< 10	253	250	ug/g	100
Arsenic	Blank Spike. Batch :	14201943	< 0.7	481	500	ug/g	96



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SPIKE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Boron	Blank Spike. Batch :	14201943	< 10	253	250	ug/g	101
Barium	Blank Spike. Batch :	14201943	< 0.2	250	250	ug/g	100
Beryllium	Blank Spike. Batch :	14201943	< 0.1	261	250	ug/g	105
Bismuth	Blank Spike. Batch :	14201943	< 10	258	250	ug/g	103
Calcium	Blank Spike. Batch :	14201943	< 20	254	250	ug/g	101
Cadmium	Blank Spike. Batch :	14201943	< 0.2	258	250	ug/g	103
Cobalt	Blank Spike. Batch :	14201943	< 0.3	252	250	ug/g	101
Chromium	Blank Spike. Batch :	14201943	< 0.2	246	250	ug/g	98
Copper	Blank Spike. Batch :	14201943	< 0.5	250	250	ug/g	100
Iron	Blank Spike. Batch :	14201943	< 10	252	250	ug/g	100
Potassium	Blank Spike. Batch :	14201943	< 20	1160	1250	ug/g	93
Lithium	Blank Spike. Batch :	14201943	0.1	254	250	ug/g	101
Magnesium	Blank Spike. Batch :	14201943	< 10	255	250	ug/g	102
Manganese	Blank Spike. Batch :	14201943	< 0.2	253	250	ug/g	101
Molybdenum	Blank Spike. Batch :	14201943	< 0.4	248	250	ug/g	99
Sodium	Blank Spike. Batch :	14201943	< 10	256	250	ug/g	102
Nickel	Blank Spike. Batch :	14201943	< 0.8	250	250	ug/g	100
Phosphorus Total (P)	Blank Spike. Batch :	14201943	< 4.0	1140	1250	ug/g	91
Lead	Blank Spike. Batch :	14201943	< 2.0	486	500	ug/g	97
Antimony	Blank Spike. Batch :	14201943	< 2.0	522	500	ug/g	104
Selenium	Blank Spike. Batch :	14201943	< 1.0	246	250	ug/g	98
Tin	Blank Spike. Batch :	14201943	< 2.0	1200	1250	ug/g	96
Strontium	Blank Spike. Batch :	14201943	< 0.1	256	250	ug/g	102
Titanium	Blank Spike. Batch :	14201943	< 0.3	254	250	ug/g	102
Uranium	Blank Spike. Batch :	14201943	< 5.0	266	250	ug/g	106
Vanadium	Blank Spike. Batch :	14201943	< 0.4	246	250	ug/g	98
Zinc	Blank Spike. Batch :	14201943	< 0.5	248	250	ug/g	99
Zirconium	Blank Spike. Batch :	14201943	< 0.5	248	250	ug/g	99
CCME PHC F2 C10-16	Blank Spike. Batch :	15201641	< 10	460	476.2	ug/g	97
CCME PHC F3 C16-34	Blank Spike. Batch :	15201641	< 10	1600	1543.4	ug/g	104
CCME PHC F4 C34-50+	Blank Spike. Batch :	15201641	< 10	96	95.92	ug/g	100
PHC GHH	Blank Spike. Batch :	14401768	< 100	4200	5000	ug/g	85
PHC GHH SILICAGEL	Blank Spike. Batch :	14401769	< 100	2700	2500	ug/g	103
Benzene	Blank Spike. Batch :	15201579	< 0.04	2.3	2.15	ug/g	107
Ethylbenzene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	100
Toluene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	100
o - Xylene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	103
m+p - Xylene	Blank Spike. Batch :	15201579	< 0.10	4.3	4.3	ug/g	100



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SPIKE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Mercury	Blank Spike. Batch :	14201966	< 0.05	0.10	.1	ug/g	96
Arsenic	RI-20	31011581	3.6	266	250	ug/g	105
Boron	RI-20	31011581	< 10	146	125	ug/g	110
Barium	RI-20	31011581	37.9	159	125	ug/g	97
Beryllium	RI-20	31011581	0.3	143	125	ug/g	114
Cadmium	RI-20	31011581	< 0.2	141	125	ug/g	112
Cobalt	RI-20	31011581	13.8	135	125	ug/g	97
Chromium	RI-20	31011581	14.2	144	125	ug/g	104
Copper	RI-20	31011581	28.6	147	125	ug/g	95
Lithium	RI-20	31011581	8.7	150	125	ug/g	113
Manganese	RI-20	31011581	390	497	125	ug/g	86
Molybdenum	RI-20	31011581	< 0.4	127	125	ug/g	102
Nickel	RI-20	31011581	66.5	185	125	ug/g	95
Lead	RI-20	31011581	7.0	245	250	ug/g	95
Antimony	RI-20	31011581	< 2.0	286	250	ug/g	115
Selenium	RI-20	31011581	< 1.0	141	125	ug/g	113
Strontium	RI-20	31011581	83.0	202	125	ug/g	95
Titanium	RI-20	31011581	240	353	125	ug/g	90
Vanadium	RI-20	31011581	21.8	150	125	ug/g	103
Zinc	RI-20	31011581	46.9	151	125	ug/g	83
Thallium	Blank Spike. Batch :	14201910	< 1.0	74.0	75	ug/g	99
Lead	Blank Spike. Batch :	14201922	< 2.0	483	500	ug/g	97
Silver	Blank Spike. Batch :	14201906	< 1.0	60.4	62.5	ug/g	97
Aluminum	Blank Spike. Batch :	14201906	< 10	254	250	ug/g	101
Arsenic	RI-31	31011592	2.7	256	250	ug/g	101
Arsenic	Blank Spike. Batch :	14201906	< 0.7	487	500	ug/g	97
Boron	RI-31	31011592	< 10	137	125	ug/g	106
Boron	Blank Spike. Batch :	14201906	< 10	255	250	ug/g	102
Barium	RI-31	31011592	36.4	161	125	ug/g	100
Barium	Blank Spike. Batch :	14201906	< 0.2	247	250	ug/g	99
Beryllium	RI-31	31011592	0.4	138	125	ug/g	110
Beryllium	Blank Spike. Batch :	14201906	< 0.1	264	250	ug/g	105
Bismuth	Blank Spike. Batch :	14201906	< 10	262	250	ug/g	105
Calcium	Blank Spike. Batch :	14201906	< 20	242	250	ug/g	96
Cadmium	RI-31	31011592	< 0.2	136	125	ug/g	108
Cadmium	Blank Spike. Batch :	14201906	< 0.2	262	250	ug/g	105
Cobalt	RI-31	31011592	18.4	145	125	ug/g	101
Cobalt	Blank Spike. Batch :	14201906	< 0.3	256	250	ug/g	103



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SPIKE SUMMARY

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Chromium	RI-31	31011592	15.4	141	125	ug/g	101
Chromium	Blank Spike. Batch :	14201906	< 0.2	249	250	ug/g	99
Copper	RI-31	31011592	34.7	160	125	ug/g	100
Copper	Blank Spike. Batch :	14201906	0.8	247	250	ug/g	98
Iron	Blank Spike. Batch :	14201906	< 10	251	250	ug/g	100
Potassium	Blank Spike. Batch :	14201906	< 20	1160	1250	ug/g	92
Lithium	RI-31	31011592	9.3	139	125	ug/g	104
Lithium	Blank Spike. Batch :	14201906	< 0.1	235	250	ug/g	94
Magnesium	Blank Spike. Batch :	14201906	< 10	248	250	ug/g	99
Manganese	RI-31	31011592	394	507	125	ug/g	90
Manganese	Blank Spike. Batch :	14201906	< 0.2	256	250	ug/g	102
Molybdenum	RI-31	31011592	< 0.4	131	125	ug/g	104
Molybdenum	Blank Spike. Batch :	14201906	< 0.4	245	250	ug/g	98
Sodium	Blank Spike. Batch :	14201906	< 10	249	250	ug/g	97
Nickel	RI-31	31011592	72.6	198	125	ug/g	100
Nickel	Blank Spike. Batch :	14201906	< 0.8	255	250	ug/g	102
Phosphorus Total (P)	Blank Spike. Batch :	14201906	< 4.0	1140	1250	ug/g	91
Lead	RI-31	31011592	8.0	254	250	ug/g	98
Lead	Blank Spike. Batch :	14201906	< 2.0	494	500	ug/g	99
Antimony	RI-31	31011592	< 2.0	296	250	ug/g	118
Antimony	Blank Spike. Batch :	14201906	< 2.0	522	500	ug/g	104
Selenium	RI-31	31011592	< 1.0	140	125	ug/g	111
Selenium	Blank Spike. Batch :	14201906	< 1.0	251	250	ug/g	100
Tin	Blank Spike. Batch :	14201906	< 2.0	1220	1250	ug/g	98
Strontium	RI-31	31011592	11.9	141	125	ug/g	104
Strontium	Blank Spike. Batch :	14201906	< 0.1	251	250	ug/g	100
Titanium	RI-31	31011592	228	338	125	ug/g	88
Titanium	Blank Spike. Batch :	14201906	< 0.3	242	250	ug/g	97
Uranium	Blank Spike. Batch :	14201906	< 5.0	260	250	ug/g	104
Vanadium	RI-31	31011592	20.5	151	125	ug/g	104
Vanadium	Blank Spike. Batch :	14201906	0.7	249	250	ug/g	99
Zinc	RI-31	31011592	94.9	210	125	ug/g	92
Zinc	Blank Spike. Batch :	14201906	1.4	251	250	ug/g	100
Zirconium	Blank Spike. Batch :	14201906	< 0.5	233	250	ug/g	93
Mercury	Blank Spike. Batch :	14201967	< 0.05	0.12	.1	ug/g	124
Thallium	Blank Spike. Batch :	14201940	< 1.0	77.0	75	ug/g	103
Lead	RI-41	31011602	111000	97500	250	ug/g	%-5400
Lead	Blank Spike. Batch :	14201863	< 10	486	500	ug/g	97



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ANALYSIS DATES

	Philip ID:	31011562	31011563	31011564	31011565
	Client ID:	RI-01	RI-02	RI-03	RI-04
CCMESOIL	CCME 99 SOILS	-	---	---	14-SEP-2001
Hg-T200M	Mercury	---	---	---	15-SEP-2001
Ni-TIR03	Nickel	13-SEP-2001	13-SEP-2001	13-SEP-2001	---
Tl-T200G	Thallium	---	---	---	11-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011566	31011567	31011568	31011569
	Client ID:	RI-05	RI-06	RI-07	RI-08
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	15-SEP-2001	15-SEP-2001	15-SEP-2001	15-SEP-2001
Tl-T200G	Thallium	11-SEP-2001	11-SEP-2001	11-SEP-2001	13-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011570	31011571	31011572	31011573
	Client ID:	RI-09	RI-10	RI-11	RI-12
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	15-SEP-2001	17-SEP-2001	15-SEP-2001	15-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001



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ANALYSIS DATES

Philip ID: Client ID:		31011574 RI-13	31011575 RI-14	31011576 RI-15	31011577 RI-16
00250760	Moisture	---	---	18-SEP-2001	18-SEP-2001
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	15-SEP-2001	17-SEP-2001	17-SEP-2001	17-SEP-2001
TI-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
PHC1PHCV	CCME PHC F1 C6-10	---	---	11-SEP-2001	11-SEP-2001
CCMEPHCS	CCMEPHCS	---	---	19-SEP-2001	17-SEP-2001
GHH--TOT	PHC GHH	---	---	24-SEP-2001	24-SEP-2001
GHS--MIN	PHC GHH SILICAGEL	---	---	25-SEP-2001	25-SEP-2001
PKG-BT17	BTEX by P&T	---	---	19-SEP-2001	19-SEP-2001
Matrix: Sampled on:		Soil 3-SEP-2001	Soil 3-SEP-2001	Soil 3-SEP-2001	Soil 3-SEP-2001
Philip ID: Client ID:		31011578 RI-17	31011579 RI-18	31011580 RI-19	31011581 RI-20
00250760	Moisture	18-SEP-2001	18-SEP-2001	18-SEP-2001	---
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	17-SEP-2001	15-SEP-2001	17-SEP-2001	15-SEP-2001
TI-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
PHC1PHCV	CCME PHC F1 C6-10	11-SEP-2001	11-SEP-2001	11-SEP-2001	---
CCMEPHCS	CCMEPHCS	17-SEP-2001	17-SEP-2001	17-SEP-2001	---
PKG-BT17	BTEX by P&T	19-SEP-2001	19-SEP-2001	19-SEP-2001	---
Matrix: Sampled on:		Soil 3-SEP-2001	Soil 3-SEP-2001	Soil 3-SEP-2001	Soil 3-SEP-2001
Philip ID: Client ID:		31011582 RI-21	31011583 RI-22	31011584 RI-23	31011585 RI-24
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	---	---
Pb-TIR03	Lead	---	---	13-SEP-2001	13-SEP-2001
Hg-T200M	Mercury	17-SEP-2001	15-SEP-2001	---	---
TI-T200G	Thallium	13-SEP-2001	13-SEP-2001	---	---
Matrix: Sampled on:		Soil 3-SEP-2001	Soil 3-SEP-2001	Soil 4-SEP-2001	Soil 4-SEP-2001



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ANALYSIS DATES

	Philip ID:	31011586	31011587	31011588	31011589
	Client ID:	RI-25	RI-26	RI-27	RI-28
STRGDONE	Storage Charge		---	---	07-SEP-2001
00250760	Moisture		---	---	18-SEP-2001
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	---
Hg-T200M	Mercury	15-SEP-2001	17-SEP-2001	17-SEP-2001	---
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	---
PHC1PHCV	CCME PHC F1 C6-10	---	---	---	11-SEP-2001
CCMEPHCS	CCMEPHCS	---	---	---	17-SEP-2001
PKG-BT17	BTEX by P&T	---	---	---	19-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011590	31011591	31011592	31011593
	Client ID:	RI-29	RI-30	RI-31	RI-32
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	13-SEP-2001	13-SEP-2001
Hg-T200M	Mercury	17-SEP-2001	17-SEP-2001	15-SEP-2001	17-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011594	31011595	31011596	31011597
	Client ID:	RI-33	RI-34	RI-35	RI-36
CCMESOIL	CCME 99 SOILS	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
Hg-T200M	Mercury	17-SEP-2001	17-SEP-2001	15-SEP-2001	15-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001



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ANALYSIS DATES

	Philip ID:	31011598	31011599	31011600	31011601
	Client ID:	RI-37	RI-38	RI-39	RI-40
CCMESOIL	CCME 99 SOILS	13-SEP-2001	---	13-SEP-2001	13-SEP-2001
Pb-TIR03	Lead	---	13-SEP-2001	---	---
Hg-T200M	Mercury	15-SEP-2001	---	17-SEP-2001	15-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	---	13-SEP-2001	13-SEP-2001
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011602			
	Client ID:	RI-41			
Pb-TIR05	Lead	12-SEP-2001			
	Matrix:	Others			
	Sampled on:	4-SEP-2001			



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BATCH NUMBERS

	Philip ID:	31011562	31011563	31011564	31011565
	Client ID:	RI-01	RI-02	RI-03	RI-04
CCMESOIL	CCME 99 SOILS	--	---	---	14201958
Hg-T200M	Mercury	---	---	---	14201965
Ni-TIR03	Nickel	14201922	14201922	14201922	---
Tl-T200G	Thallium	-	---	---	14201874
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011566	31011567	31011568	31011569
	Client ID:	RI-05	RI-06	RI-07	RI-08
CCMESOIL	CCME 99 SOILS	14201958	14201958	14201958	14201958
Hg-T200M	Mercury	14201965	14201965	14201965	14201965
Tl-T200G	Thallium	14201874	14201874	14201874	14201909
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011570	31011571	31011572	31011573
	Client ID:	RI-09	RI-10	RI-11	RI-12
CCMESOIL	CCME 99 SOILS	14201958	14201958	14201958	14201958
Hg-T200M	Mercury	14201965	14201965	14201965	14201965
Tl-T200G	Thallium	14201909	14201909	14201909	14201909
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001



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BATCH NUMBERS

	Philip ID:	31011574	31011575	31011576	31011577
	Client ID:	RI-13	RI-14	RI-15	RI-16
00250760	Moisture	---	-	14401735	14401735
CCMESOIL	CCME 99 SOILS	14201958	14201943	14201943	14201943
Hg-T200M	Mercury	14201965	14201965	14201965	14201965
Tl-T200G	Thallium	14201909	14201909	14201909	14201909
PHC1PHCV	CCME PHC F1 C6-10	---	---	15201578	15201578
CCMEPHCS	CCMEPHCS	---	---	15201641	15201641
GHH-TOT	PHC GHH	---	---	14401768	14401768
GHH-S-MIN	PHC GHH SILICAGEL	---	---	14401769	14401769
PKG-BT17	BTEX by P&T	---	---	15201579	15201579
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011578	31011579	31011580	31011581
	Client ID:	RI-17	RI-18	RI-19	RI-20
00250760	Moisture	14401735	14401735	14401735	---
CCMESOIL	CCME 99 SOILS	14201943	14201943	14201943	14201943
Hg-T200M	Mercury	14201965	14201966	14201966	14201966
Tl-T200G	Thallium	14201909	14201909	14201909	14201909
PHC1PHCV	CCME PHC F1 C6-10	15201578	15201578	15201578	---
CCMEPHCS	CCMEPHCS	15201641	15201641	15201641	---
PKG-BT17	BTEX by P&T	15201579	15201579	15201579	---
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001
	Philip ID:	31011582	31011583	31011584	31011585
	Client ID:	RI-21	RI-22	RI-23	RI-24
CCMESOIL	CCME 99 SOILS	14201943	14201943	---	---
Pb-TIR03	Lead	---	---	14201922	14201922
Hg-T200M	Mercury	14201966	14201966	---	---
Tl-T200G	Thallium	14201909	14201910	---	---
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	4-SEP-2001	4-SEP-2001



ANALYTICAL SERVICES

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BATCH NUMBERS

	Philip ID:	31011586	31011587	31011588	31011589
	Client ID:	RI-25	RI-26	RI-27	RI-28
00250760	Moisture	---	---	---	14401735
CCMESOIL	CCME 99 SOILS	14201943	14201943	14201943	---
Hg-T200M	Mercury	14201966	14201966	14201966	---
Tl-T200G	Thallium	14201910	14201910	14201910	---
PHC1PHCV	CCME PHC F1 C6-10	---	---	---	15201578
CCMEPHCS	CCMEPHCS	---	---	---	15201641
PKG-BT17	BTEX by P&T	---	---	---	15201579
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011590	31011591	31011592	31011593
	Client ID:	RI-29	RI-30	RI-31	RI-32
CCMESOIL	CCME 99 SOILS	14201943	14201943	14201906	14201906
Hg-T200M	Mercury	14201966	14201966	14201966	14201966
Tl-T200G	Thallium	14201910	14201910	14201910	14201910
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011594	31011595	31011596	31011597
	Client ID:	RI-33	RI-34	RI-35	RI-36
CCMESOIL	CCME 99 SOILS	14201906	14201906	14201906	14201906
Hg-T200M	Mercury	14201966	14201966	14201967	14201967
Tl-T200G	Thallium	14201910	14201910	14201910	14201910
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001



ANALYTICAL SERVICES

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BATCH NUMBERS

	Philip ID:	31011598	31011599	31011600	31011601
	Client ID:	RI-37	RI-38	RI-39	RI-40
CCMESOIL	CCME 99 SOILS	14201906	---	14201906	14201906
Pb-TIR03	Lead	---	14201922	---	---
Hg-T200M	Mercury	14201967	---	14201967	14201967
Tl-T200G	Thallium	14201910	---	14201910	14201940
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	4-SEP-2001	4-SEP-2001	4-SEP-2001	4-SEP-2001
	Philip ID:	31011602			
	Client ID:	RI-41			
Pb-TIR05	Lead	14201863			
	Matrix:	Others			
	Sampled on:	4-SEP-2001			



ANALYTICAL SERVICES

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BLANK SUMMARY

All method blanks were less than MDL, except the following:

Parameter	Batch	Sparcode	Blank Conc.	MDL	Unit
Chromium	14201958	Cr-TIR03	0.8	0.2	ug/g
Lithium	14201958	Li-TIR03	0.2	0.1	ug/g
Lead	14201958	Pb-TIR03	3.3	2.0	ug/g
Titanium	14201958	Ti-TIR03	0.3	0.3	ug/g
Zinc	14201958	Zn-TIR03	0.7	0.5	ug/g
Lithium	14201943	Li-TIR03	0.1	0.1	ug/g
Copper	14201906	Cu-TIR03	0.8	0.5	ug/g
Vanadium	14201906	V--TIR03	0.7	0.4	ug/g
Zinc	14201906	Zn-TIR03	1.4	0.5	ug/g



PHILIP SERVICES

PHILIP ANALYTICAL SERVICES
9619 - 42nd Avenue
Edmonton, AB T6E 5R2

Phone: (780) 465-1212
Fax: (780) 450-4187
Toll Free: 1-877-465-8889

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 4

COMPANY NAME:

EarthTech Canada

PH. #: 480-6880

FAX #: 480-2100

CLIENT PROJECT ID: (P)

19340-01

E dm.

Radio Island

SAMPLER NAME (PRINT):

Don Roy

PROJECT MANAGER:

Will Wawrychuk

FIELD SAMPLE ID	PHILIP LAB # (Lab Use Only)	MATRIX				SAMPLING		HEADSPACE VAPOUR
		GROUND WATER	SURFACE WATER	SOIL	OTHER	# CONTAINERS	DATE	TIME
1 RT-34	11595					1	Sept 4	
2 RT-35	11596					1		
3 RT-36	11597					1		
4 RT-37	11598					1		
5 RT-38	11599					1		
6 RT-39	11600					1		
7 RT-40	11601					1		
8 RT-41	11602					1		
9								
10								
11								
12								

Metals
Pb
Lead Paint Test

Paint chip Sample.
- called 12:30 Sept 7

PO. NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE

LAB USE ONLY

ARRIVAL TEMPERATURE °C

LAB INFORMATION

Sept 11/01 TDM

ACCOUNTING CONTACT:

SPECIAL REPORTING OR BILLING INSTRUCTIONS

EDT ☐

RELINQUISHED BY SAMPLER:

Don Roy

DATE: Sept 5

TIME

RECEIVED BY:

First Aid

RECEIVED BY:

EarthTech Canada

Two Week ☐
One Week ☐
48 Hours ☐
24 Hours ☐

TAT



PHILIP ANALYTICAL SERVICES
9619 - 42nd Avenue
Edmonton, AB T6E 5R2

Phone: (780) 465-1212
Fax: (780) 450-4187
Toll Free: 1-877-465-8889

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 2 OF 1

ANALYSIS REQUEST

~~42012475~~

COMPANY NAME:

Edm. Tech. Condo

PH #: 408-6800

FAX #: 408-2121

CLIENT PROJECT ID: (S)

19340-01

Radio Island.

SAMPLER NAME (PRINT):

Don Roy

PROJECT MANAGER:

Will Wanychart.

FIELD SAMPLE ID	PHILIP LAB # (Lab Use Only)	MATRIX				# CONTAINERS	SAMPLING		HEADSPACE VAPOUR	metals CWS-TAM
		GROUND WATER	SURFACE WATER	SOIL	OTHER		DATE	TIME		
1 RT-12	11573			✓		1	Sept 3			✓
2 RT-13	11574			✓		1				✓
3 RT-14	11575			✓		1				✓
4 RT-15	11576			✓		2				✓
5 RT-16	11577			✓		2				✓
6 RT-17	11578			✓		2				✓
7 RT-18	11579			✓		2				✓
8 RT-19	11580			✓		2				✓
9 RT-20	11581			✓		1				✓
10 RT-21	11582			✓		1				✓
11 RT-22	11583			✓		1				✓
12										

P.O. NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE

TAT

Two Week
One Week
48 Hours
24 Hours

☒ Two Week
☐ One Week
☐ 48 Hours
☐ 24 Hours

ACCOUNTING CONTACT:

SPECIAL REPORTING OR BILLING INSTRUCTIONS

EDT ☐

APPROVAL TEMPERATURE °C

LAB USE ONLY
LAB INFORMATION

18°

Sept 24/01 17M

Code

RELINQUISHED BY SAMPLER:

Don Roy

DATE

Sept 24/01

TIME

TIME

RECEIVED BY:

Edm. Tech. Condo

ACQUIRED BY:

First. AIC

DATE

TIME

RECEIVED BY:

Edm. Tech. Condo



ANALYTICAL SERVICES

14-Nov-01
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Certificate of Analysis

9619 42 Avenue
Edmonton, Alberta
Canada T6E 5R2
Tel 780 465 1212
Fax 780 450 4187Reported To :

EARTH TECH CANADA INC.

Client Code RC

17203 - 103 AVENUE
EDMONTON, ALBERTA
T5S 1J4Attention : WILL WAWNYCHUK
Phone : (780) 453-0709
FAX : (780) 488-2121Project Information :Project ID : 19340-01
Submitted By: DON ROYRequisition Forms :

Form 42112479 shipped on 05-Sep-01 received on 07-Sep-01 logged on 7-Sep-01 completed on 14-Nov-01

Remarks :

- + All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- + 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- + Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- + Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- + All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- + This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Maureen Brown



ANALYTICAL SERVICES

14-Nov-01
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ANALYTICAL REPORT

Form 42112479

Client : EARTH TECH CANADA INC.
Project : 19340-01

Philip ID : 31011573 31011574 31011575 31011576
Client ID : RI-12 RI-13 RI-14 RI-15

Sparcode	Parameter	Unit	MDL				
PHYSICAL							
TCLPTC01	TCLP Extraction	date			01/11/09		
00250760	Moisture	%(W/W)	0.3				26.7
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	5480	3100	5070	6370
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	254	56.6	148
As-TIR03	Arsenic	ug/g	0.7	2.6	4.9	6.5	8.1
Ba-TIR03	Barium	ug/g	0.2	168	85.4	244	381
Be-TIR03	Beryllium	ug/g	0.1	0.3	0.1	0.3	0.4
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B--TIR03	Boron	ug/g	10	< 10	< 10	14	< 10
Cd-TIR03	Cadmium	ug/g	0.2	1.0	0.2	115	7.2
Ca-TIR03	Calcium	ug/g	20	2580	1010	3190	8050
Cr-TIR03	Chromium	ug/g	0.2	20.1	15.0	11.4	8.1
Co-TIR03	Cobalt	ug/g	0.3	19.2	4.1	116	6.0
Cu-TIR03	Copper	ug/g	0.5	177	57.6	623	141
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	11900	7020	4170	13400
Pb-TIR03	Lead	ug/g	2.0	527	115000	21200	14000
Li-TIR03	Lithium	ug/g	0.1	6.0	2.9	2.6	8.8
Mg-TIR03	Magnesium	ug/g	10	3760	1400	1450	1060
Mn-TIR03	Manganese	ug/g	0.2	235	174	107	3100
Hg-T200M	Mercury	ug/g	0.05	0.42	0.42	13.8	4.72
Mo-TIR03	Molybdenum	ug/g	0.4	0.9	1.3	4.4	3.5
Ni-TIR03	Nickel	ug/g	0.8	28.2	21.4	115	14.4
P--TIR03	Phosphorus Total (P)	ug/g	4.0	389	496	1060	817
K-TIR03	Potassium	ug/g	20	1610	830	554	454
Se-TIR03	Selenium	ug/g	1.0	2.7	2.0	9.6	2.4
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	234	216	305	250
Sr-TIR03	Strontium	ug/g	0.1	20.3	16.9	52.2	147
S--TIR03	Sulphur	ug/g	20	697	15200	13700	810
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	7.7	38.4	22.8	44.3
Ti-TIR03	Titanium	ug/g	0.3	540	357	109	152
U--TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Form 42112479

Client : EARTH TECH CANADA INC.
Project : 19340-01

Philip ID : 31011573 31011574 31011575 31011576
Client ID : RI-12 RI-13 RI-14 RI-15

Sparcode	Parameter	Unit	MDL				
V--TIR03	Vanadium	ug/g	0.4	26.4	18.1	51.4	27.2
Zn-TIR03	Zinc	ug/g	0.5	316	36.7	19500	1720
Zr-TIR03	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5
METALS LEACHABLE							
Pb-LIR08	Lead Leachable	mg/L	0.5	---	420	---	---
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date	---	---	---	---	01/09/17
EX995170	Volat. Soil Extract.	date	---	---	---	---	01/09/08
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	---	---	---	< 10
HCl-CALC	CCME PHC F1-BTEX	ug/g	---	---	---	---	< 10
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	---	---	---	< 10
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	---	---	---	3500
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	---	---	---	3500
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	---	---	---	No
GHH--TOT	PHC GHH	ug/g	100	---	---	---	19000
GHHs-MIN	PHC GHH SILICAGEL	ug/g	100	---	---	---	11000
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.02	---	---	---	< 0.02
T001PT12	Toluene	ug/g	0.10	---	---	---	< 0.10
B021PT12	Ethylbenzene	ug/g	0.10	---	---	---	< 0.10
X003PT12	m+p - Xylene	ug/g	0.10	---	---	---	< 0.10
X002PT12	o - Xylene	ug/g	0.10	---	---	---	< 0.10
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	---	---	---	97
VS03PT12	d8-Toluene	%	0	---	---	---	100
Ed10PT12	Ethylbenzene-d10	%	60	---	---	---	65

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



ANALYTICAL SERVICES

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ANALYTICAL REPORT

Form 42112479

Client : EARTH TECH CANADA INC.
Project : 19340-01

Philip ID : 31011577 31011578 31011579 31011580
Client ID : RI-16 RI-17 RI-18 RI-19

Sparcode	Parameter	Unit	MDL				
PHYSICAL							
TCLPTC01	TCLP Extraction	date					01/11/09
00250760	Moisture	%(W/W)	0.3	17.2	10.6	16.7	30.8
METALS TOTAL							
Al-TIR03	Aluminum	ug/g	10	3770	3700	7890	7700
Sb-TIR03	Antimony	ug/g	2.0	3.7	4.0	10.2	< 2.0
As-TIR03	Arsenic	ug/g	0.7	5.2	2.8	0.8	1.7
Ba-TIR03	Barium	ug/g	0.2	1120	679	138	175
Be-TIR03	Beryllium	ug/g	0.1	0.5	0.2	0.3	0.3
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10	< 10
B-TIR03	Boron	ug/g	10	< 10	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	1.2	4.4	0.9	1.7
Ca-TIR03	Calcium	ug/g	20	11300	3380	2380	2700
Cr-TIR03	Chromium	ug/g	0.2	8.0	21.5	27.3	27.1
Co-TIR03	Cobalt	ug/g	0.3	4.6	4.6	9.1	21.0
Cu-TIR03	Copper	ug/g	0.5	148	407	48.4	71.5
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	15600	10900	12600	9570
Pb-TIR03	Lead	ug/g	2.0	2880	2220	793	196
Li-TIR03	Lithium	ug/g	0.1	8.1	6.3	12.9	12.2
Mg-TIR03	Magnesium	ug/g	10	2550	2340	4600	4910
Mn-TIR03	Manganese	ug/g	0.2	570	407	90.8	34.3
Hg-T200M	Mercury	ug/g	0.05	31.0	14.1	0.72	1.70
Mo-TIR03	Molybdenum	ug/g	0.4	1.0	0.5	0.6	1.2
Ni-TIR03	Nickel	ug/g	0.8	15.5	22.6	30.4	37.7
P-TIR03	Phosphorus Total (P)	ug/g	4.0	949	643	342	379
K-TIR03	Potassium	ug/g	20	511	684	1670	1910
Se-TIR03	Selenium	ug/g	1.0	< 1.0	< 1.0	< 1.0	1.2
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	201	220	307	315
Sr-TIR03	Strontium	ug/g	0.1	119	31.8	15.6	20.8
S-TIR03	Sulphur	ug/g	20	753	871	294	1440
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	102	43.0	2.6	2.1
Ti-TIR03	Titanium	ug/g	0.3	232	379	710	687
U-TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0	< 5.0

Matrix : Soil Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

CONTINUED on page 5



ANALYTICAL SERVICES

14-Nov-01
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ANALYTICAL REPORT

Form 42112479

Client : EARTH TECH CANADA INC.
Project : 19340-01

Philip ID : 31011577 31011578 31011579 31011580
Client ID : RI-16 RI-17 RI-18 RI-19

Sparcode	Parameter	Unit	MDL				
V--TIRO3	Vanadium	ug/g	0.4	15.8	13.5	34.9	34.6
Zn-TIRO3	Zinc	ug/g	0.5	3980	1240	584	733
Zr-TIRO3	Zirconium	ug/g	0.5	< 0.5	< 0.5	< 0.5	< 0.5
METALS LEACHABLE							
Ph-LIRO8	Lead Leachable	mg/L	0.5	---	---	---	< 0.5
HYDROCARBONS							
EX995149	PHC EXT F2 - 4	date		01/09/17	01/09/17	01/09/17	01/09/17
EX995170	Volat. Soil Extract.	date		01/09/08	01/09/08	01/09/08	01/09/08
PHC1PHCV	CCME PHC F1 C6-10	ug/g	10	< 10	< 10	< 10	50
HC1-CALC	CCME PHC F1-BTEX	ug/g		< 10	< 10	< 10	50
PHC2PHCS	CCME PHC F2 C10-16	ug/g	10	4100	3800	34	29000
PHC3PHCS	CCME PHC F3 C16-34	ug/g	10	30000	10000	590	20000
PHC4PHCS	CCME PHC F4 C34-50+	ug/g	10	15000	1700	120	1300
BASEPHCS	PHC F2-4 BASELINE 0	Y/N	Yes	No	Yes	Yes	Yes
GHH--TOT	PHC GHH	ug/g	100	74000	---	---	---
GHHs-MIN	PHC GHH SILICAGEL	ug/g	100	56000	---	---	---
VOLATILE ORGANICS							
B020PT12	Benzene	ug/g	0.02	< 0.02	< 0.02	< 0.02	< 0.02
T001PT12	Toluene	ug/g	0.10	0.15	< 0.10	< 0.10	< 0.10
B021PT12	Ethylbenzene	ug/g	0.10	< 0.10	< 0.10	< 0.10	< 0.10
X003PT12	m+p - Xylene	ug/g	0.10	0.59	< 0.10	< 0.10	< 0.10
X002PT12	o - Xylene	ug/g	0.10	0.20	< 0.10	< 0.10	< 0.10
SURROGATE RECOVERY							
VS01PT12	Bromofluorobenzene	%	0	98	95	96	103
VS03PT12	d8-Toluene	%	0	99	102	98	100
Ed10PT12	Ethylbenzene-d10	%	60	73	84	73	67

Matrix : Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00



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ANALYTICAL REPORT

Form 42112479

Client : EARTH TECH CANADA INC.
Project : 19340-01

Philip ID : 31011581 31011582 31011583
Client ID : RI-20 RI-21 RI-22

Sparcode	Parameter	Unit	MDL			
PHYSICAL						
TCLPTC01	TCLP Extraction	date				01/11/09
METALS TOTAL						
Al-TIR03	Aluminum	ug/g	10	5030	1430	752
Sb-TIR03	Antimony	ug/g	2.0	< 2.0	< 2.0	< 2.0
As-TIR03	Arsenic	ug/g	0.7	3.6 (1)	10.8	7.2
Ba-TIR03	Barium	ug/g	0.2	37.9	41.1	251
Be-TIR03	Beryllium	ug/g	0.1	0.3	0.2	< 0.1
Bi-TIR03	Bismuth	ug/g	10	< 10	< 10	< 10
B-TIR03	Boron	ug/g	10	< 10	< 10	< 10
Cd-TIR03	Cadmium	ug/g	0.2	< 0.2	14.4	6.7
Ca-TIR03	Calcium	ug/g	20	91000	5680	4340
Cr-TIR03	Chromium	ug/g	0.2	14.2	3.2	25.5
Co-TIR03	Cobalt	ug/g	0.3	13.8	29.0	188
Cu-TIR03	Copper	ug/g	0.5	28.6	71.4	70.8
EX994288	Dry & Grind	date		01/09/10	01/09/10	01/09/10
Fe-TIR03	Iron	ug/g	10	11900	9690	65200
Pb-TIR03	Lead	ug/g	2.0	7.0	174	458
Li-TIR03	Lithium	ug/g	0.1	8.7	0.7	0.6
Mg-TIR03	Magnesium	ug/g	10	20700	592	908
Mn-TIR03	Manganese	ug/g	0.2	390	99.9	5020
Hg-T200M	Mercury	ug/g	0.05	< 0.05	0.72	2.12
Mo-TIR03	Molybdenum	ug/g	0.4	< 0.4	10.1	8.3
Ni-TIR03	Nickel	ug/g	0.8	66.5	87.6	110
P-TIR03	Phosphorus Total (P)	ug/g	4.0	422	918	3640
K-TIR03	Potassium	ug/g	20	1050	110	130
Se-TIR03	Selenium	ug/g	1.0	< 1.0	7.6	6.6
Ag-TIR03	Silver	ug/g	1.0	< 1.0	< 1.0	< 1.0
Na-TIR03	Sodium	ug/g	10	148	153	222
Str-TIR03	Strontium	ug/g	0.1	83.0	24.6	23.3
S-TIR03	Sulphur	ug/g	20	226	5230	3490
Te-TIR03	Tellurium	ug/g	5.0	< 5.0	< 5.0	< 5.0
Tl-T200G	Thallium	ug/g	1.0	< 1.0	< 1.0	< 1.0
Sn-TIR03	Tin	ug/g	2.0	< 2.0	54.9	24.5
Ti-TIR03	Titanium	ug/g	0.3	240	22.7	15.8
U-TIR03	Uranium	ug/g	5.0	< 5.0	< 5.0	< 5.0
V-TIR03	Vanadium	ug/g	0.4	21.8	25.5	41

Matrix : Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

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Form 42112479Client : EARTH TECH CANADA INC.
Project : 19340-01Philip ID : 31011581 31011582 31011583
Client ID : RI-20 RI-21 RI-22

Sparcode	Parameter	Unit	MDL			
Zn-TIR03	Zinc	ug/g	0.5	46.9	3580	1670
Zr-TIR03	Zirconium	ug/g	0.5	1.3	< 0.5	< 0.5
METALS LEACHABLE						
Pb-LIR03	Lead Leachable	mg/L	0.5	---	---	< 0.5

Matrix : Soil Soil Soil
Sampled on: 01/09/03 16:00 01/09/03 16:00 01/09/03 16:00

Result comments and/or text results :

(1) DUPLICATES DO NOT MATCH FOR ARSENIC DUE TO NON-HOMOGENEOUS SAMPLE



ANALYTICAL SERVICES

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Form 42112479

Parameter	Client ID	Philip ID	Sample Conc.	Duplicate Conc.	MDL	Unit	Relative % Diff.
Silver	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Aluminum	RI-20	31011581	5030	4840	10	ug/g	3.85
Arsenic	RI-20	31011581	3.6	2.9	0.7	ug/g	21.54
Boron	RI-20	31011581	< 10	< 10	10	ug/g	0.00
Barium	RI-20	31011581	37.9	37.6	0.2	ug/g	0.79
Beryllium	RI-20	31011581	0.3	0.3	0.1	ug/g	0.00
Bismuth	RI-20	31011581	< 10	< 10	10	ug/g	0.00
Calcium	RI-20	31011581	91000	81600	20	ug/g	10.89
Cadmium	RI-20	31011581	< 0.2	< 0.2	0.2	ug/g	0.00
Cobalt	RI-20	31011581	13.8	13.5	0.3	ug/g	2.20
Chromium	RI-20	31011581	14.2	14.1	0.2	ug/g	0.71
Copper	RI-20	31011581	28.6	27.6	0.5	ug/g	3.56
Iron	RI-20	31011581	11900	11600	10	ug/g	2.55
Potassium	RI-20	31011581	1050	996	20	ug/g	5.28
Lithium	RI-20	31011581	8.7	8.5	0.1	ug/g	2.33
Magnesium	RI-20	31011581	20700	21000	10	ug/g	-1.44
Manganese	RI-20	31011581	390	370	0.2	ug/g	5.26
Molybdenum	RI-20	31011581	< 0.4	< 0.4	0.4	ug/g	0.00
Sodium	RI-20	31011581	148	138	10	ug/g	6.99
Nickel	RI-20	31011581	66.5	65.8	0.8	ug/g	1.06
Phosphorus Total (P)	RI-20	31011581	422	359	4.0	ug/g	16.13
Lead	RI-20	31011581	7.0	6.7	2.0	ug/g	4.38
Sulphur	RI-20	31011581	226	205	20	ug/g	9.74
Antimony	RI-20	31011581	< 2.0	< 2.0	2.0	ug/g	0.00
Selenium	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Tin	RI-20	31011581	< 2.0	< 2.0	2.0	ug/g	0.00
Strontium	RI-20	31011581	83.0	74.5	0.1	ug/g	10.79
Tellurium	RI-20	31011581	< 5.0	< 5.0	5.0	ug/g	0.00
Titanium	RI-20	31011581	240	238	0.3	ug/g	0.84
Uranium	RI-20	31011581	< 5.0	< 5.0	5.0	ug/g	0.00
Vanadium	RI-20	31011581	21.8	21.2	0.4	ug/g	2.79
Zinc	RI-20	31011581	46.9	46.3	0.5	ug/g	1.29
Zirconium	RI-20	31011581	1.3	1.2	0.5	ug/g	8.00
Thallium	RI-20	31011581	< 1.0	< 1.0	1.0	ug/g	0.00
Mercury	RI-20	31011581	< 0.05	< 0.05	0.05	ug/g	0.00



ANALYTICAL SERVICES

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Form 42112479

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Silver	Blank Spike. Batch :	14201958	< 1.0	59.1	62.5	ug/g	94
Aluminum	Blank Spike. Batch :	14201958	< 10	258	250	ug/g	103
Arsenic	Blank Spike. Batch :	14201958	< 0.7	475	500	ug/g	95
Boron	Blank Spike. Batch :	14201958	< 10	253	250	ug/g	101
Barium	Blank Spike. Batch :	14201958	< 0.2	246	250	ug/g	98
Beryllium	Blank Spike. Batch :	14201958	< 0.1	263	250	ug/g	105
Bismuth	Blank Spike. Batch :	14201958	< 10	252	250	ug/g	101
Calcium	Blank Spike. Batch :	14201958	< 20	248	250	ug/g	98
Cadmium	Blank Spike. Batch :	14201958	< 0.2	253	250	ug/g	101
Cobalt	Blank Spike. Batch :	14201958	< 0.3	246	250	ug/g	98
Chromium	Blank Spike. Batch :	14201958	0.8	244	250	ug/g	97
Copper	Blank Spike. Batch :	14201958	< 0.5	241	250	ug/g	96
Iron	Blank Spike. Batch :	14201958	< 10	255	250	ug/g	100
Potassium	Blank Spike. Batch :	14201958	< 20	1190	1250	ug/g	95
Lithium	Blank Spike. Batch :	14201958	0.2	243	250	ug/g	97
Magnesium	Blank Spike. Batch :	14201958	< 10	249	250	ug/g	99
Manganese	Blank Spike. Batch :	14201958	< 0.2	247	250	ug/g	99
Molybdenum	Blank Spike. Batch :	14201958	< 0.4	242	250	ug/g	97
Sodium	Blank Spike. Batch :	14201958	< 10	247	250	ug/g	97
Nickel	Blank Spike. Batch :	14201958	< 0.8	244	250	ug/g	98
Phosphorus Total (P)	Blank Spike. Batch :	14201958	< 4.0	1110	1250	ug/g	88
Lead	Blank Spike. Batch :	14201958	3.3	486	500	ug/g	96
Antimony	Blank Spike. Batch :	14201958	< 2.0	521	500	ug/g	104
Selenium	Blank Spike. Batch :	14201958	< 1.0	248	250	ug/g	99
Tin	Blank Spike. Batch :	14201958	< 2.0	1210	1250	ug/g	97
Strontium	Blank Spike. Batch :	14201958	< 0.1	245	250	ug/g	98
Titanium	Blank Spike. Batch :	14201958	0.3	249	250	ug/g	99
Uranium	Blank Spike. Batch :	14201958	< 5.0	256	250	ug/g	101
Vanadium	Blank Spike. Batch :	14201958	< 0.4	249	250	ug/g	99
Zinc	Blank Spike. Batch :	14201958	0.7	250	250	ug/g	100
Zirconium	Blank Spike. Batch :	14201958	< 0.5	241	250	ug/g	96
Thallium	Blank Spike. Batch :	14201909	< 1.0	73.0	75	ug/g	97
Mercury	Blank Spike. Batch :	14201965	< 0.05	0.10	.1	ug/g	96
Lead Leachable	Blank Spike. Batch :	14202585	< 0.5	4.8	5	mg/L	97
Silver	Blank Spike. Batch :	14201943	< 1.0	60.7	62.5	ug/g	97
Aluminum	Blank Spike. Batch :	14201943	< 10	253	250	ug/g	100
Arsenic	Blank Spike. Batch :	14201943	< 0.7	481	500	ug/g	96
Boron	Blank Spike. Batch :	14201943	< 10	253	250	ug/g	101



ANALYTICAL SERVICES

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Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Barium	Blank Spike. Batch :	14201943	< 0.2	250	250	ug/g	100
Beryllium	Blank Spike. Batch :	14201943	< 0.1	261	250	ug/g	105
Bismuth	Blank Spike. Batch :	14201943	< 10	258	250	ug/g	103
Calcium	Blank Spike. Batch :	14201943	< 20	254	250	ug/g	101
Cadmium	Blank Spike. Batch :	14201943	< 0.2	258	250	ug/g	103
Cobalt	Blank Spike. Batch :	14201943	< 0.3	252	250	ug/g	101
Chromium	Blank Spike. Batch :	14201943	< 0.2	246	250	ug/g	98
Copper	Blank Spike. Batch :	14201943	< 0.5	250	250	ug/g	100
Iron	Blank Spike. Batch :	14201943	< 10	252	250	ug/g	100
Potassium	Blank Spike. Batch :	14201943	< 20	1160	1250	ug/g	93
Lithium	Blank Spike. Batch :	14201943	0.1	254	250	ug/g	101
Magnesium	Blank Spike. Batch :	14201943	< 10	255	250	ug/g	102
Manganese	Blank Spike. Batch :	14201943	< 0.2	253	250	ug/g	101
Molybdenum	Blank Spike. Batch :	14201943	< 0.4	248	250	ug/g	99
Sodium	Blank Spike. Batch :	14201943	< 10	256	250	ug/g	102
Nickel	Blank Spike. Batch :	14201943	< 0.8	250	250	ug/g	100
Phosphorus Total (P)	Blank Spike. Batch :	14201943	< 4.0	1140	1250	ug/g	91
Lead	Blank Spike. Batch :	14201943	< 2.0	486	500	ug/g	97
Antimony	Blank Spike. Batch :	14201943	< 2.0	522	500	ug/g	104
Selenium	Blank Spike. Batch :	14201943	< 1.0	246	250	ug/g	98
Tin	Blank Spike. Batch :	14201943	< 2.0	1200	1250	ug/g	96
Strontium	Blank Spike. Batch :	14201943	< 0.1	256	250	ug/g	102
Titanium	Blank Spike. Batch :	14201943	< 0.3	254	250	ug/g	102
Uranium	Blank Spike. Batch :	14201943	< 5.0	266	250	ug/g	106
Vanadium	Blank Spike. Batch :	14201943	< 0.4	246	250	ug/g	98
Zinc	Blank Spike. Batch :	14201943	< 0.5	248	250	ug/g	99
Zirconium	Blank Spike. Batch :	14201943	< 0.5	248	250	ug/g	99
CCME PHC F2 C10-16	Blank Spike. Batch :	15201641	< 10	460	476	ug/g	97
CCME PHC F3 C16-34	Blank Spike. Batch :	15201641	< 10	1600	1540	ug/g	104
CCME PHC F4 C34-50+	Blank Spike. Batch :	15201641	< 10	96	95.9	ug/g	100
PHC GHH	Blank Spike. Batch :	14401768	< 100	4200	5000	ug/g	85
PHC GHH SIL/CAGEL	Blank Spike. Batch :	14401769	< 100	2700	2500	ug/g	103
Benzene	Blank Spike. Batch :	15201579	< 0.02	2.3	2.15	ug/g	107
Ethylbenzene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	100
Toluene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	100
o - Xylene	Blank Spike. Batch :	15201579	< 0.10	2.2	2.15	ug/g	103
m+p - Xylene	Blank Spike. Batch :	15201579	< 0.10	4.3	4.3	ug/g	100
Mercury	Blank Spike. Batch :	14201966	< 0.05	0.10	.1	ug/g	96



ANALYTICAL SERVICES

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Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Arsenic	RI-20	31011581	3.6	266	250	ug/g	105
Boron	RI-20	31011581	< 10	146	125	ug/g	110
Barium	RI-20	31011581	37.9	159	125	ug/g	97
Beryllium	RI-20	31011581	0.3	143	125	ug/g	114
Cadmium	RI-20	31011581	< 0.2	141	125	ug/g	112
Cobalt	RI-20	31011581	13.8	135	125	ug/g	97
Chromium	RI-20	31011581	14.2	144	125	ug/g	104
Copper	RI-20	31011581	28.6	147	125	ug/g	95
Lithium	RI-20	31011581	8.7	150	125	ug/g	113
Manganese	RI-20	31011581	390	497	125	ug/g	86
Molybdenum	RI-20	31011581	< 0.4	127	125	ug/g	102
Nickel	RI-20	31011581	66.5	185	125	ug/g	95
Lead	RI-20	31011581	7.0	245	250	ug/g	95
Antimony	RI-20	31011581	< 2.0	286	250	ug/g	115
Selenium	RI-20	31011581	< 1.0	141	125	ug/g	113
Strontium	RI-20	31011581	83.0	202	125	ug/g	95
Titanium	RI-20	31011581	240	353	125	ug/g	90
Vanadium	RI-20	31011581	21.8	150	125	ug/g	103
Zinc	RI-20	31011581	46.9	151	125	ug/g	83
Thallium	Blank Spike, Batch :	14201910	< 1.0	74.0	75	ug/g	99



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Philip ID:		31011573	31011574	31011575	31011576
Client ID:		RI-12	RI-13	RI-14	RI-15
TCLPTC01	TCLP Extraction	---	09-NOV-2001	---	---
00250760	Moisture	---	---	---	18-SEP-2001
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	15-SEP-2001	15-SEP-2001	17-SEP-2001	17-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
Pb-LIR08	Lead Leachable	---	14-NOV-2001	---	---
PHC1PHCV	CCME PHC F1 C6-10	---	---	---	11-SEP-2001
CCMEPHCS	CCMEPHCS	---	---	---	19-SEP-2001
GHH-TOT	PHC GHH	---	---	---	24-SEP-2001
GHH5-MIN	PHC GHH SILICAGEL	---	---	---	25-SEP-2001
PKG-BT17	BTEX by P&T	---	---	---	19-SEP-2001
Matrix:		Soil	Soil	Soil	Soil
Sampled on:		3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001

Philip ID:		31011577	31011578	31011579	31011580
Client ID:		RI-16	RI-17	RI-18	RI-19
TCLPTC01	TCLP Extraction	---	---	---	09-NOV-2001
00250760	Moisture	18-SEP-2001	18-SEP-2001	18-SEP-2001	18-SEP-2001
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	17-SEP-2001	17-SEP-2001	15-SEP-2001	17-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001	13-SEP-2001
Pb-LIR08	Lead Leachable	---	---	---	14-NOV-2001
PHC1PHCV	CCME PHC F1 C6-10	11-SEP-2001	11-SEP-2001	11-SEP-2001	11-SEP-2001
CCMEPHCS	CCMEPHCS	17-SEP-2001	17-SEP-2001	17-SEP-2001	17-SEP-2001
GHH-TOT	PHC GHH	24-SEP-2001	---	---	---
GHH5-MIN	PHC GHH SILICAGEL	25-SEP-2001	---	---	---
PKG-BT17	BTEX by P&T	19-SEP-2001	19-SEP-2001	19-SEP-2001	19-SEP-2001
Matrix:		Soil	Soil	Soil	Soil
Sampled on:		3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001



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Philip ID:		31011581	31011582	31011583
Client ID:		RI-20	RI-21	RI-22
TCLPTC01	TCLP Extraction	---	---	09-NOV-2001
CCMESOIL	CCME 99 SOILS	14-SEP-2001	14-SEP-2001	14-SEP-2001
Hg-T200M	Mercury	15-SEP-2001	17-SEP-2001	15-SEP-2001
Tl-T200G	Thallium	13-SEP-2001	13-SEP-2001	13-SEP-2001
Pb-LIR08	Lead Leachable	---	---	14-NOV-2001
Matrix:		Soil	Soil	Soil
Sampled on:		3-SEP-2001	3-SEP-2001	3-SEP-2001



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	Philip ID:	31011573	31011574	31011575	31011576
	Client ID:	RI-12	RI-13	RI-14	RI-15
TCLPTC01	TCLP Extraction	---	14202529	---	---
00250760	Moisture	---	---	---	14401735
CCMESOIL	CCME 99 SOILS	14201958	14201958	14201943	14201943
Hg-T200M	Mercury	14201965	14201965	14201965	14201965
Tl-T200G	Thallium	14201909	14201909	14201909	14201909
Pb-LIR08	Lead Leachable	---	14202585	---	---
PHC1PHCV	CCME PHC F1 C6-10	---	---	---	15201578
CCMEPHCS	CCMEPHCS	---	---	---	15201641
GHH--TOT	PHC GHH	---	---	---	14401768
GHHs-MIN	PHC GHH SILICAGEL	---	---	---	14401769
PKG-BT17	BTEX by P&T	---	---	---	15201579
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001

	Philip ID:	31011577	31011578	31011579	31011580
	Client ID:	RI-16	RI-17	RI-18	RI-19
TCLPTC01	TCLP Extraction	---	---	---	14202529
00250760	Moisture	14401735	14401735	14401735	14401735
CCMESOIL	CCME 99 SOILS	14201943	14201943	14201943	14201943
Hg-T200M	Mercury	14201965	14201965	14201966	14201966
Tl-T200G	Thallium	14201909	14201909	14201909	14201909
Pb-LIR08	Lead Leachable	---	---	---	14202585
PHC1PHCV	CCME PHC F1 C6-10	15201578	15201578	15201578	15201578
CCMEPHCS	CCMEPHCS	15201641	15201641	15201641	15201641
GHH--TOT	PHC GHH	14401768	---	---	---
GHHs-MIN	PHC GHH SILICAGEL	14401769	---	---	---
PKG-BT17	BTEX by P&T	15201579	15201579	15201579	15201579
	Matrix:	Soil	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001	3-SEP-2001



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	Philip ID:	31011581	31011582	31011583
	Client ID:	RI-20	RI-21	RI-22
TCLPTC01	TCLP Extraction	---	---	14202529
CCMESOIL	CCME 99 SOILS	14201943	14201943	14201943
Hg-T200M	Mercury	14201966	14201966	14201966
Tl-T200G	Thallium	14201909	14201909	14201910
Pb-LIR08	Lead Leachable	---	---	14202585
	Matrix:	Soil	Soil	Soil
	Sampled on:	3-SEP-2001	3-SEP-2001	3-SEP-2001



ANALYTICAL SERVICES

14-Nov-01
Page 16 of 16**BLANK SUMMARY**
Form 42112479

All method blanks were less than MDL, except the following:

Parameter	Batch	Sparcode	Blank Conc.	MDL	Unit
Chromium	14201958	Cr-TIR03	0.3	0.2	ug/g
Lithium	14201958	Li-TIR03	0.2	0.1	ug/g
Lead	14201958	Pb-TIR03	3.3	2.0	ug/g
Titanium	14201958	Ti-TIR03	0.3	0.3	ug/g
Zinc	14201958	Zn-TIR03	0.7	0.5	ug/g
Lithium	14201943	Li-TIR03	0.1	0.1	ug/g

F A X

To: Maureen Brown Date: Nov 5, 2001
Company: PSC Fax #: 450-4187

From: Don Roy Ext. #: 453-0709
Address: Earth Tech (Canada) Inc. Sending from Fax #:
17203 - 103 Avenue 780 - 488-2121
Edmonton, AB T5S 1J4 Proj #: 48018

Subject: Leachate Testing

cc: Chris Doupe, PWGSS Fax # 497-3842

**URGENT**

THIS IS YOUR ONLY COPY



ORIGINAL TO FOLLOW BY MAIL

ORIGINAL TO FOLLOW BY COURIER

Comments:

Hi Maureen:

Last week I spoke with Colleen and asked that samples 11562-11602 be held until further notice pending a decision to do leachate testing for heavy metals. On November 2 we received authorization from PWGSS to proceed with leachate test on a few of the higher concentrated samples originally analysed for one or more metal parameters. I spoke with Chris Doupe this morning and we would like a "low, middle, high" sample analysed for leachate. Please proceed with conducting TCLP Leachate tests (Lead Only) on the following samples.

- 2 RI13, PSC# 11574, Lead @ 115,000 PPM
8 RI19, PSC# 11580, Lead @ 9,570 PPM
11 RI22, PSC# 11583, Lead @ 65,200 PPM

42112479

Can you open this?

Please note that the invoice for this work should be sent to Earth Tech rather than PWGSS.

Thank you,

Don Roy

*quoted ~~for~~ \$45 for TCLP metals / sample**Due Nov. 13/01 MD
WR.*

If you do not receive 1 pages (including cover page),
please call us as soon as possible @ 780-488-6800.

E A R T H  **T E C H**A **TYCO** INTERNATIONAL LTD. COMPANY

Document 2

**APPENDIX D
SPECIAL PROVISIONS
ENVIRONMENTAL
SERVICES**

The production and use of this Report is conditional upon the following agreement by the Client and Others who may use or rely upon it.

MANDATE OF EARTH TECH

This Report has been prepared pursuant to the instructions of the Client, and is subject to the constraints imposed by those instructions. Earth Tech (Canada) Inc. ("Earth Tech") and the Client are aware of these instructions and constraints. Others, who wish to rely upon this Report in any manner, should inquire of the Client for the terms of Earth Tech's mandate in preparing this Report.

BASIS OF REPORT

2.1 Representations to Earth Tech by Client

This Report has been prepared for the specific site, development, design objective, and purpose described to Earth Tech by the Client and is specifically based on all of the aforesaid.

Inaccuracies or alterations, of any of the matters upon which this Report is based, will affect the reliability and applicability of this Report.

2.2 Representations to Earth Tech by Other Persons

Earth Tech may have relied upon the representations or opinions of persons other than the Client in the course of preparing this Report. Earth Tech may not have checked the accuracy of such representations or opinions except where directed to do so by the Client. The accuracy of these representations and opinions will affect the accuracy of this Report.

2.3 Time Sensitivity of Report

The findings expressed in this Report by Earth Tech were valid, in accordance with generally accepted engineering practice and procedures, at the time that they were made. The Client and Others are advised that the conditions upon which such findings were based, and the findings themselves may be subject to change as a result of the passage of time.

USE OF REPORT BY THE CLIENT

The Client recognizes that projects involving pollutants and hazardous waste, as defined below, create extraordinary risks. In consideration of the said extraordinary risks and in consideration of Earth Tech providing the services to the Client in connection with the project on which pollutants and hazardous wastes are involved, the Client agrees that Earth Tech's liability to the Client, including liability resulting from claims by Third Parties upon the Client, with respect to any matter in any way arising out of Earth Tech's involvement with pollutants and hazardous wastes associated shall be limited to or otherwise protected as provided in paragraphs (a) and (b) below.

- (a) Earth Tech's liability to the Client in connection with pollutants and hazardous waste is absolutely limited, both in contract and in tort for any and all claims arising out of or in connection with the project to a total maximum aggregate amount not to exceed the cost of reperformance of the services at the sole cost of Earth Tech for that portion of the services proven to be in error.

It is further agreed that such limitation shall be exclusive of the liability of Earth Tech to the Client which may otherwise be provided for in this Agreement for claims unrelated to pollutants and hazardous wastes.

In further consideration of Earth Tech providing the services to the Client in connection with the project in which pollutants and hazardous wastes are involved, the Client agrees that in connection with incidents and claims initiated by Third Parties involving pollutants and hazardous wastes, the Client shall indemnify, defend and hold harmless Earth Tech of and from any and all suits, actions, legal and administrative or arbitration proceedings, claims, demands, damages, penalties, fines, losses, costs and expenses of whatsoever kind or character, arising or alleged to arise out of the services of Earth Tech or any claim against Earth Tech arising or alleged to arise from the acts, omissions or work of others. Such indemnification shall apply to the fullest extent permitted by law, regardless of fault or breach of contract by Earth Tech and shall

include the fees and charges of lawyers in defending or advising Earth Tech as to such claims under the Agreement.

Without limiting the generality of the foregoing, such indemnity extends to claims which arise out of the actual or threatened dispersal, discharge, escape, release or saturation (whether sudden or gradual) of any pollutant to hazardous waste in or into the atmosphere, or on, on to, upon, in or into the surface or subsurface, soils, water or water courses, persons, objects or any other tangible matter.

- (b) Nothing herein shall relieve Earth Tech from their obligations to provide the services required by this Agreement and generally as required by standard engineering practice current as of the date of the performance of the services.
- (c) For all purposes of this statement of limitations, "pollutants and hazardous wastes" shall mean any solid, liquid, gaseous or thermal irritant or contaminant, including without limitation smoke, vapour, soot, fumes, acids, alkalies, chemicals and wastes, including without limitation, pollutants, hazardous or special waste as defined in any federal, provincial or municipal laws.

SUBCONSULTANTS AND SUBCONTRACTORS

As a result of its mandate, Earth Tech may hire companies or individuals with special expertise or services not available within Earth Tech. These services are for the Client's benefit. The Client agrees to pay for the services of subconsultants and subcontractors. The Client also agrees to indemnify Earth Tech for any damage in any way resulting from the error, omission or negligent act of such subconsultants or subcontractors, including, without limiting the generality of the foregoing, the laboratory testing by subconsultants.

JOB SITE SAFETY

Earth Tech is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of Earth Tech personnel on the site shall not be construed in any way to relieve the Client or any other persons on site from their responsibilities for job site safety.

HAZARDOUS CONDITIONS AND EMERGENCY PROCEDURE

The Client undertakes to inform Earth Tech of all hazardous conditions, or possible hazardous conditions which are known to it. The Client recognizes that the activities of Earth Tech may uncover previously unknown hazardous materials or conditions and that such a discovery may result in the necessity to undertake emergency procedures to protect Earth Tech employees as well as other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed to. The Client agrees to pay Earth Tech for any expenses incurred as a result of such discoveries and to compensate Earth Tech through payment of additional fees and expenses for time spent by Earth Tech to deal with the consequences of such discoveries.

NOTIFICATION OF AUTHORITIES

The Client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that government bodies, and other persons, be informed and the client agrees that notification to such bodies or persons as required may be done by Earth Tech in its reasonably exercised discretion.

USE OF REPORT BY OTHERS

Others wishing to rely upon this Report in any manner may do so only upon condition that such use, and the consequences of such use, are entirely at their own risk and that they understand fully the terms of the Mandate and Basis of this Report.

It is further agreed by such Others that Earth Tech will not be liable to them in any manner including any liability in contract or in tort for any damages whatsoever arising from such use.