clearly labelled and stored at low temperatures in a secured area prior to and following the analysis.

2. Extraction

Soil samples were homogenised and subsamples dried for moisture determination. A wet sample (10 g dry equivalent weight) was ground with anhydrous sodium sulphate and Ottawa sand to a free-flowing powder, and loaded into a round-bottomed flask. Pesticide grade hexane (20 mL) was added, and the flask ultrasonically agitated. A 1 mL aliquot of the hexane extract was pipetted from the flask in a manner ensuring no transfer of solid material, and sealed in a gas chromatography (GC) vial.

3. Standard Preparation

A Varsol standard calibration sample (710 μg/mL) was prepared by adding Varsol (9 μL) to pesticide grade hexane (10 mL).

4. GC Analysis

Samples were run by gas chromatography on a DB5 capillary column (30 m, 0.25 mm i.d. x 0.25 μm film thickness). TPH was quantified by comparing the chromatogram peak area of the sample with that of the Varsol standard. Compound identity was determined by comparing the sample chromatogram with those of known hydrocarbons.

F. Analysis of Asbestos in Floor Tiles and Insulation Materials

Asbestos content of the bulk material was determined by polarized light microscopy dispersion staining. The analysis was carried out at the Occupational Health and Safety Resource Centre, University of Western Ontario, London, Ontario.

G. Analysis of Polychlorinated Biphenyls (PCBs) in Paint Samples

1. Summary

The above analyses were conducted by the Environmental Sciences Group Analytical Laboratory, located at the Royal Military College in Kingston, Ontario. Each sample was contained in an appropriate container, clearly labeled and stored at low temperatures in a secured area prior to and following the analysis.

All samples were spiked with an aliquot of decachlorobiphenyl (DCBP), a surrogate standard, prior to analysis by gas chromatography (GC) with electron capture detection (ECD). Soil, concrete, paint and swabs were extracted with methylene chloride using soxhlet apparatus. Extracts were concentrated using a rotovap and the solvent was exchanged to hexane before 'clean-up' of the sample. This was accomplished by passing the hexane containing the PCBs through a Florisil column.

2. Extraction Method

All samples were thoroughly homogenized before sampling for the analysis. Soil samples were subsampled for the determination of wet/dry weight ratio.

Accurately weighed wet soil (15 g), concrete (10 g), paint (1 g) and swabs to which DCBP, sodium sulfate (40 g) and Ottawa sand (20 g) were added, were extracted by soxhlet for 4 hours at 4-6 cycles per hour using 250 mL of methylene chloride. The extract was then concentrated by roto-evaporation to approximately 1 mL, 5 mL of hexane was added and again evaporated to 1 mL. This was repeated twice more resulting in 1 mL of hexane solvent, which was then applied to a Florisil column for clean-up. The column was thoroughly rinsed with hexane and the eluant containing the PCBs was diluted to 10.0 mL. In the case of swab samples the final volume was 2.0 mL. A GC vial (2 mL) was then filled and submitted for analysis by GC/ECD.

3. Instrumental Analysis

Each sample was analyzed using an HP 5890 series II Plus gas chromatograph equipped with a ^{63}Ni electron capture detector (GC/ECD), a SPB^{TM}-1 fused silica capillary column (30 m, 0.25 mm ID x 0.25 μm film thickness) and the HPChem station software. The Chromatographic conditions were as follows: Sample volume - 2 μL , Splitless injection, Initial temperature - 100°C for 2 min; Ramp - 10°C/min to 150°C, 5°C/min to 300°C; Final time 5 min. Carrier gas used was helium at a flow rate of 20 mL/min. Nitrogen was used as a make-up gas for the ECD.

All values were reported as ppm (μg/g) on a dry weight basis, with the exception of the swabs which were reported as μg/100 cm^2 PCB.

H. Method for the Determination of Leachable Inorganics

1. Summary

The above analyses were conducted by the Analytical Services Unit, located at Queen's University in Kingston, Ontario. Each sample was contained in an appropriate container, clearly labeled and stored at low temperatures in a secured area prior to and following the analysis.

2. Extraction Method

All samples were thoroughly homogenized before sampling for the analysis. Soil samples were subsampled for the determination of wet/dry weight ratio. Wet soil (50 g dry weight equivalent) was placed in a labeled leachate container with distilled deionized water (800 mL). The bottles were placed in a leachate extraction box and rotated at 10 rpm. The pH of the sample was checked at 15 minutes, 1 hour, 3 hours, 6 hours, 22 hours, and 24 hours. 0.5 N acetic acid was used to lower the pH to 5.0 +/- 0.2 if applicable, at these times. No more than 200 mL of acid was used.

The liquid was vacuum filtered using a 0.45 μm filter. The resulting liquid was analyzed according to the methods for water as described in the above sections.

APPENDIX B: QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

An internal quality assurance/quality control program was implemented to allow the monitoring of data quality on an ongoing basis. All samples were given sequential, numerical codings before submission to the analytical firms; these codings masked any information concerning site location, sample type (for instance, whether a sample came from an outfall, a landfill, etc.) or possible concentration of the sample. Aspects of the QA/QC program and the results are discussed below.

A. QA/QC for Inorganic Analysis - Queen's University Analytical Services Unit (ASU)

1. Accuracy

Accuracy was monitored internally by ASU using 28 replicates of NRC Canada Marine Reference Sediment MESS-2 (Table B-1). These were run concurrently with sample batches throughout the analytical program. Good agreement with the certified values was obtained for all elements, with the exception of nickel, chromium and lead. Results for these elements were consistently low relative to the certified values, but this discrepancy is attributed to differences in the digestion methods.

A similar internal monitoring program was employed by ASU for the analysis of plants using certified reference materials NBS 1547 Peach Leaves and NBS 1515 Apple Leaves. These reference materials have been certified for copper, nickel, lead, zinc and arsenic, and were analyzed along with the plant samples (Table B-2). Only copper and zinc, however, were present at detectable concentrations; good agreement with the certified values was obtained. The concentrations of nickel, lead and arsenic in the standards are lower than ASU's detection limits. Measured values for these elements were below the certified detection limits, which was the best possible agreement obtainable.

2. Precision/Repeatability

Precision was monitored externally by ESG using 29 pairs of soil sample duplicates; these were homogenized in the field and submitted blind as separate samples to ASU for analysis. The results are presented in Table B-3. Average relative standard deviations or coefficients of variation (standard deviation divided by the mean) for sample pairs were expressed as percentages and used to evaluate laboratory precision.

Acceptable limits are generally considered to be less than 30% relative standard deviation, with 20% or less considered good agreement. The average relative standard deviations for all detectable inorganic elements in soil field duplicates were 20% or less with the exception of lead which was showed acceptable agreement at 29%.

Internal monitoring of precision was also carried out by ASU through the use of analytical replicates. Forty soil and sediment samples and six plant samples were analyzed in duplicate and some in triplicate or quadruplicate (Table B-4, Table B-5). The precision of analytical duplicate results is generally better than that of field duplicate results, which may differ because of unavoidable sample heterogeneity. Average relative standard deviations for copper (9.9%), nickel (4.8%), cobalt (4.2%), cadmium (3.1%), lead (19.6%), zinc (7.9%), chromium (5.5%) and arsenic (16.6%) in the soil replicates were less than 20% indicating good to excellent analytical precision for soil analysis (Table B-4). Average relative standard deviations for the plant analytical duplicates were low, with Cu (3.8%), Ni (8.7), Co (7.1%), Cd (4.8%), Pb (14%), Zn (3.3%), Cr (8.4%) and As (16.2%) indicating very good precision for the plant analytical replicates (Table B-5). Two paint chip samples were analyzed for lead at Radio Island and one of the samples was run in duplicate. The results of the duplicate analyses are noted at the bottom of Table B-5 and the relative standard deviation for the duplicate was very good at 15.5%.

B. QA/QC for PCB Analysis - Axys Analytical Services Ltd (Axys)

The QA/QC protocol used by Axys for PCBs consisted of the batch method, in which samples were worked up in batches with associated quality control samples. Each batch consisted of nine or fewer samples, along with one QA/QC sample (certified or internal spiked reference material), one analytical duplicate and a procedural blank. Spiked material was also used in cases where analytical results were anticipated to be outside of the concentration ranges of the available certified reference materials. Each batch was carried through sample workup, instrumentation and interpretation as a unit, and the sample results were interpreted in relation to the associated QA/QC results. All QA/QC data from each batch were considered together in order to evaluate the overall quality of the analytical program. The results of the organic QA/QC program are discussed below, and the QA/QC data from Axys is summarized in Table B-6 through Table B-14.

1. Accuracy

Axys monitored the accuracy of PCB analysis of soils internally using spiked soil reference materials (for Aroclors 1242, 1254 and 1260) which were analyzed 28 times during the analytical program (Table B-6). Good agreement was found between determined and expected values for all three Aroclors (within 17% of the expected value), indicating that analytical accuracy throughout the soil Aroclor analysis program was good.

Accuracy for water PCB Aroclor analyses was also monitored internally by Axys using spiked reference materials. Three water spike samples were analyzed during the analytical program. (Table B-6). The determined values for the Aroclors were also very close to the expected value indicating very good accuracy for the water PCB analyses. Accuracy for plant tissue sample Aroclor analysis was monitored by Axys using N.I.S.T. Certified Reference Material 1588 (Cod Liver Oil). Three reference samples were analyzed in total with good agreement found between determined and certified values for all three Aroclors (Table B-7).

Interferences for PCB analysis as Aroclors were monitored internally throughout the program using 28 soil blanks, three water blanks and three plant tissue blanks (Table B-8). One of the soil analytical blanks and two of the water blanks showed some quantifiable Aroclors but the levels are extremely low and close to the detection limits. The plant analytical blanks showed no detectable Aroclors.

2. Precision/Repeatability

Precision was monitored externally by ESG using 29 pairs of soil sample duplicates which were homogenized in the field during collection and submitted blind to Axys for analysis. Results for these sample replicates are presented in Table B-9. The average relative standard deviations, expressed as a percentage, for soil samples ranged from a low of 0% to a high of 100% for one sample with average relative standard deviation of 35%. The differences in some of the samples must be attributed to insufficient homogenization of the sample in the field since the analytical duplicates described below show good accuracy in the lab.

Precision was also monitored internally by Axys, through the use of 23 soil and sediment analytical replicates and one plant analytical replicate (Table B-10). Results for the plant samples were below detection limits but the average relative standard deviation, or coefficient of variation (standard deviation divided by the mean), for soil and sediment samples was 16%. This indicates good correlation between duplicates and represents good accuracy in the analysis of PCB Aroclors at Axys.

C. QA/QC for Chlorinated Pesticides - Axys

1. Accuracy

The accuracy of pesticide analysis was monitored internally by Axys using two spiked soil reference materials which were analyzed twice each during the analytical program. One spiked water reference solution was analyzed once (Table B-11). Recoveries for most of the chlorinated pesticides were within 20% of the spiked value, indicating good analytical accuracy.

Accuracy of the pesticide analysis for biota samples was monitored by the analysis of certified reference material N.I.S.T. 1588 Cod Liver Oil which was analyzed for pesticides along with the plant samples. Determined values for most compounds were well within the range of certified values for the reference material, indicating very good accuracy for the plant pesticides (Table B-12).

Interferences were also checked internally through the use of analytical blanks. (Table B-13). Four soil blanks, one water blank, and one plant blank were analyzed and values for all chlorinated pesticide concentrations were below or very close to the detection limits.

2. Precision/Repeatability

Precision for pesticide analysis was monitored internally by Axys through the analysis of two soil samples in duplicate (Table B-14). The majority of compounds analyzed in the soil samples were below detection limits. The few compounds that were quantifiable in one sample were within the acceptable range of 20% relative standard deviation. The second sample also showed few compounds above detectable levels and two of these had relative standard deviations >50%. The concentrations are quite low and differences are magnified by the statistic at low levels.

D. QA/QC for Polycyclic Aromatic Hydrocarbons (PAHs) - ESG lab, RMC

1. Accuracy

The accuracy of PAH analysis of soils was monitored internally using certified NRC reference sediment material HS-3 (Table B-15). This table reflects the reference material analyzed throughout the analytical program in the fall of 1996. Results for naphthalene, and benzo(k)fluoranthene may tend to be slightly higher than the certified values because of a methodology bias.

Interferences for PAHs in soils were monitored internally throughout the analytical program using four analytical blanks (Table B-16). All compounds were below detection limits.

2. Precision

The precision of the PAH analyses was monitored internally using three pairs of soil analytical duplicates (Table B-17). Only one compound, pyrene, showed detectable levels and there was good agreement between the duplicates.

E. QA/QC for Total Petroleum Hydrocarbon (TPH) - ASU

1. Precision

Internal monitoring for precision was conducted using eight sets of analytical duplicates. The average relative standard deviations for these duplicates was 19% indicating good agreement (Table B-18).

Table B-1: Summary of Inorganic Analysis Results for Soil Internal Standards

	MESS-2	
Element	Certified Value ppm (μg/g)	Mean (n=28)
Cu	**39.3 ±2.0**	36 ± 2.5
Ni	**49.3 ± 1.8**	41 ± 2.2
Co	**13.8 ± 1.4**	12.4 ± 0.71
Cd	**0.24 ± 0.01**	<1.0
Pb	**21.9 ± 1.2**	15.3 ± 1.7
Zn	**172 ± 16**	154 ± 7.5
Cr	**106 ± 8**	52 ± 9.4
As	**20.7 ± 0.8**	18 ± 1.5

Table B-2: Inorganic Analysis Results for Plant Tissue Standard

	1. NBS 1547 Peach Leaves		*2. NBS 1515 Apple Leaves*	
Element	Certified Value ppm (μg/g)	Mean (n=2)	Certified Value ppm (μg/g)	Mean (n=4)
Cu	**3.7 ± 0.4**	4.1	**5.64 ± 0.24**	6.4 ± 0.13
Ni	**0.69 ± 0.09**	<5	**0.91 ± 0.12**	<5
Co	-	<5	-	<5
Cd	-	<0.5	-	<0.5
Pb	**0.87 ± 0.03**	<15	**0.47 ± 0.024**	<15
Zn	**17.9 ± 0.4**	18.7	**12.5 ± 0.3**	13.2 ± 0.44
Cr	-	<10	-	<10
As	**0.06 ± 0.018**	<0.2	**0.038 ± 0.007**	<0.2

Table B-3: Inorganic Element Results for Soil and Sediment Field Duplicates

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Location
				ppm					
ESG7719	8.8	<5.0	<5.0	<1.0	16.2	27	<20	0.44	24m ENE of ESG7704
ESG7720	7.0	<5.0	<5.0	<1.0	21	26	<20	0.25	
Std Dev	1.3	-	-		3.4	0.71	-	0.13	
Rel Std Dev	16.1	-	-		18.2	2.7	-	39	
ESG7714	4.4	<5.0	<5.0	<1.0	17.8	27	<20	0.44	1.5m S of POL tank 3 below valve
ESG7715	<3.0	<5.0	<5.0	<1.0	<10.0	16.3	<20	0.44	
Std Dev			-			7.6	-	0	
Rel Std Dev		-	-			35	-	0	
ESG7741	110	9.3	<5.0	<1.0	25	58	<20	0.84	In narrow drainage, 63m W of ESG7740
ESG7742	230	11.5	5.6	<1.0	47	90	21	1.1	
Std Dev	85	1.6	-	-	15.6	23	-	0.18	
Rel Std Dev	50	15	-	-	43	31	-	19	
ESG7750	6.2	<5.0	<5.0	<1.0	35	110	<20	0.3	In stain, 3m SE of ESG7749
ESG7751	11.1	<5.0	<5.0	<1.0	21	94	<20	0.22	
Std Dev	3.5	-	-		9.9	11.3	-	0.06	
Rel Std Dev	40	-	-		35	11.1	-	22	
ESG7789	9.0	<5.0	<5.0	<1.0	50	42	<20	0.69	10.5m W of W side of Garage
ESG7790	9.8	<5.0	<5.0	<1.0	66	40	<20	0.3	foundation, 9m E of ESG7750
Std Dev	0.57	-	-	-	11.3	1.4	-	0.28	
Rel Std Dev	6.0	-	-		19.5	3.4	-	56	
ESG7731	34	<5.0	<5.0	<1.0	110	73	<20	0.74	55m W of ESG7729
ESG7732	32	<5.0	<5.0	<1.0	64	83	<20	0.74	
Std Dev	1.4	-	-		33	7.1	-	0	
Rel Std Dev	4.3	-	-	-	37	9.1	-	0	

Table B-3: Inorganic Element Results for Soil and Sediment Field Duplicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Location
				ppm					
ESG7761	11.8	6.2	<5.0	<1.0	11.6	74	<20	0.59	In stain within DOT Mess Hall
ESG7762	11.2	7.3	5.6	<1.0	<10.0	65	<20	0.6	foundation
Std Dev	0.42	0.78	-	-	-	6.4	-	0.01	
Rel Std Dev	3.7	11.5	-	-	-	9.2	-	1.2	
ESG7774	7	<5.0	<5.0	<1.0	17.4	22	<20	0.84	In stain on beach 9m W of ESG7773
ESG7775	6.2	<5.0	<5.0	<1.0	20	23	<20	0.59	
Std Dev	0.57	-	-	-	1.8	0.71	-	0.18	
Rel Std Dev	8.6	-	-	-	9.8	3.1	-	25	
ESG7655	14.6	10.2	5.6	<1.0	<10.0	34	<20	<0.2	~ 1.5 nautical miles NE of the site.
ESG7656	14.2	10.7	<5.0	<1.0	<10.0	34	<20	<0.2	
Std Dev	0.28	0.35	-	-	-	0	-	-	
Rel Std Dev	2.0	3.4	-	-	-	0	-	-	
ESG7513	42	13.8	<5.0	<1.0	40	342	<20	0.3	~ 4.5 m S of NE corner of the
ESG7514	29	13.6	<5.0	<1.0	43	184	21	0.3	maintenance shed
Std Dev	9.2	0.14	-	-	2.1	112	-	0	
Rel Std Dev	26	1.0	-	-	5.1	42	-	0	
ESG7521	19.4	15.5	<5.0	<1.0	349	187	27	0.4	S edge of maintenance garage close to
ESG7522	13.4	12.2	5.9	<1.0	140	114	26	0.2	SW corner (5m).
Std Dev	4.2	2.3	-	-	148	52	0.71	0.14	
Rel Std Dev	26	16.8	-	-	60	34	2.7	47	
ESG7530	15.0	16.7	7.9	<1.0	<10	45	<20	0.2	In the middle of N wall of generator
ESG7531	17.3	16.7	5.9	<1.0	<10	4[illegible]	30	0.2	building
Std Dev	1.6	0	1.4	-	-	2.8	-	0	
Rel Std Dev	10.1	0	20	-	-	6.6	-	0	

Table B-3: Inorganic Element Results for Soil and Sediment Field Duplicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Location
				ppm					
ESG7541	17.2	39	7.9	<1.0	<10	77	41	0.2	At the N end, midway along the
ESG7542	15.1	41	7.0	<1.0	<10	59	54	<0.2	foundation
Std Dev	1.5	1.7	0.64	-	-	12.7	9.2	-	
Rel Std Dev	9.2	4.2	8.5	-		18.7	19.4	-	
ESG7550	27	44	8.4	<1.0	<10	66	67	0.3	At SW corner of supply depot, 12 m SSE
ESG7551	28	50	9.8	<1.0	<10	68	71	0.2	of tag 46.
Std Dev	0.99	3.8	0.99	-	-	1.4	2.8	0.07	
Rel Std Dev	3.6	8.1	10.9	-	-	2.1	4.1	28	
ESG7562	6.7	<5.0	<5.0	<1.0	2180	173	<20	0.2	At SE corner of kitchen / mess hall
ESG7563	6.4	6.1	<5.0	<1.0	3620	192	<20	<0.2	
Std Dev	0.21	-	-	-	1020	13.4	-	-	
Rel Std Dev	3.2	-	-		35	7.4	-	-	
ESG7590	14.6	16.1	6.1	<1.0	10	33	30	<0.2	~ 9.5 m SW of tag 83, 5.5 m WSW of
ESG7591	12.9	15.2	5.6	<1.0	<10	33	27	<0.2	tag 85
Std Dev	1.2	0.64	0.35	-	-	0	2.1	-	
Rel Std Dev	8.7	4.1	6.0	-	-	0	7.4	-	
ESG7580	10.3	13.5	<5.0	<1.0	42	42	22	<0.2	At E edge of garbage dump, 14 m due E
ESG7581	8.6	11.8	<5.0	<1.0	42	40	21	<0.2	of tag 73.
Std Dev	1.2	1.2	-	-	0	1.4	0.71	-	
Rel Std Dev	12.7	9.5	-	-	0	3.4	3.3	-	
ESG7572	25	12.6	<5.0	<1.0	26	189	<20	<0.2	In a drainage ~ 90 m SSW of SW corner
ESG7573	17.3	9.3	<5.0	<1.0	22	118	<20	<0.2	of messhall
Std Dev	5.6	2.3	-	-	2.8	50	-	-	
Rel Std Dev	26	21	-		11.8	33	-	-	

Table B-3: Inorganic Element Results for Soil and Sediment Field Duplicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Location
				ppm					
ESG7601	45	16.4	<5.0	<1.0	11.1	81	28	<0.2	In the center of the dump
ESG7602	61	16.8	5.5	<1.0	14.2	122	29	<0.2	due E of tag 92
Std Dev	11.4	0.26	-	-	2.2	29	0.83	-	
Rel Std Dev	22	1.5	-	-	17.5	28	2.9	-	
ESG7614	18.9	28	8.0	<1.0	14.0	41	48	0.6	At toe of crushed barrel pile
ESG7615	20	28	8.7	<1.0	39	52	53	0.6	~ 11 m N of the shoreline.
Std Dev	0.92	0.07	0.49	-	17.7	7.8	3.5	0	
Rel Std Dev	4.7	0.25	5.9	-	67	16.7	7.0	0	
ESG7646	15.2	20	6.4	<1.0	<10	31	34	<0.2	~ 24 m WSW of tag 135 and
ESG7647	21	27	7.4	<1.0	<10	38	41	0.4	37 m S of tag 133
Std Dev	4.0	4.4	0.71	-	-	4.9	4.9	-	
Rel Std Dev	22	18.7	10.2	-	-	14.3	13.2	-	
ESG7631	20	10.8	<5.0	<1.0	16	224	25	0.3	~ 1.5 m W of W side of the original
ESG7632	11.8	9.1	<5.0	<1.0	<10	116	21	<0.2	warehouse foundation
Std Dev	5.8	1.2	-	-	-	76	2.8	-	
Rel Std Dev	36	12.1	-	-	-	45	12.3	-	
ESG8477	23	45	11.8	<1.0	<10.0	28	71	0.5	61°18'583''N, 64°50,549''W
ESG8478	19.9	39	10	<1.0	<10.0	23	65	0.2	
Std Dev	2.2	4.2	1.3	-	-	3.5	4.2	0.21	
Rel Std Dev	10.2	10.1	11.7	-	-	13.9	6.2	61	
ESG8405	31	<5.0	<5.0	<1.0	1800	560	<20.0	1.5	Inside winch shed, 1.5m N of S wall
ESG8406	43	<5.0	<5.0	3.5	980	800	<20.0	0.9	
Std Dev	8.5	-	-	-	580	170	-	0.42	
Rel Std Dev	23	-	-	-	42	25	-	35	

Table B-3: Inorganic Element Results for Soil and Sediment Field Duplicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As	Location
				ppm					
ESG8414	39	26	10.7	<1.0	96	182	25	1.2	30m from 8413, radio room drainage
ESG8415	243	24	9.2	<1.0	154	234	21	1.2	
Std Dev	144	1.4	1.1	-	41	37	2.8	0	
Rel Std Dev	102	5.7	10.7	-	33	17.7	12.3	0	
ESG8437	23	35	10.3	<1.0	<10.0	42	29	1.6	Adjacent to small pool of water
ESG8438	32	48	13.3	<1.0	<10.0	55	34	1.9	in winch shed drainage
Std Dev	6.4	9.2	2.1	-	-	9.2	3.5	0.21	
Rel Std Dev	23	22	18	-	-	19	11.2	12.1	
ESG8453	419	27	12.0	10.3	11220	20820	28	3.3	S side of foundation of generator
ESG8454	920	27	11.4	10.2	11760	14560	26	7.3	building, 3m from E wall
Std Dev	354	0	0.42	0.07	382	4420	1.4	2.8	
Rel Std Dev	53	0	3.6	0.69	3.3	25	5.2	53	
ESG8463	354	36	14.7	3.1	18860	2720	29	10.8	Drainage leading from S of generator
ESG8464	347	44	17.0	4.0	13400	3260	43	9.9	foundation, 13m from 8453
Std Dev	4.9	5.7	1.6	0.64	3860	382	9.9	0.64	
Rel Std Dev	1.4	14.1	10.3	17.9	24	12.8	27	6.1	
ESG8425	16.8	24	7.8	<1.0	10.6	25	25	1.7	Narrow drainage, 6m from ocean
ESG8426	17.3	22	6.7	<1.0	27	27	21	2.1	
Std Dev	0.35	1.4	0.78	-	11.6	1.4	2.8	0.28	
Rel Std Dev	2.1	6.1	10.7	-	62	5.4	12.3	14.9	
Average Rel Std Dev	**19.8**	**8.8**	**10.5**	**9.3**	**29**	**16.4**	**9.8**	**21**	
Std Dev	**± 22**	**± 7.1**	**± 4.7**	**± 12.2**	**± 20**	**± 13.1**	**± 6.8**	**± 21**	

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
				(ppm)				
Soil								
ESG8463	291	37	15.1	3.1	22340	2780	30	11.5
ESG8463	416	36	14.2	3.1	15380	2680	28	10
Std Dev	88	0.71	0.64	0	4920	71	1.4	1.1
Rel Std Dev	25	1.9	4.3	0	26	2.6	4.9	9.9
ESG8479	41	58	17.8	<1.0	<10	55	42	2.3
ESG8479	41	53	17.8	<1.0	<10	52	40	2.3
Std Dev	0	3.5	0		-	2.1	1.4	0
Rel Std Dev	0	6.4	0		-	4	3.4	0
ESG8405	36	<5.0	<5.0	<1.0	1820	442	<20	1.9
ESG8405	26	<5.0	<5.0	<1.0	1780	660	<20	1
Std Dev	7.1	-	-		28	154	-	0.64
Rel Std Dev	23	-	-	-	1.6	28	-	44
ESG8426	17.4	22	7.1	<1.0	31	24	21	1.6
ESG8426	17.2	22	6.3	<1.0	23	29	21	2.6
Std Dev	0.14	0	0.57	-	5.7	3.5	0	0.71
Rel Std Dev	0.82	0	8.4	-	21	13.3	0	34
ESG8449	88	27	11.2	1.3	7160	3580	28	3.6
ESG8449	68	26	11.3	1.3	4640	2480	29	2.6
Std Dev	14.1	0.71	0.07	0	1780	780	0.71	0.71
Rel Std Dev	18.1	2.7	0.63	0	30	26	2.5	23
ESG8456	880	27	11	9	8340	7740	46	5.3
ESG8456	239	29	11.4	7.8	8260	4960	45	4.6
Std Dev	453	1.4	0.28	0.85	57	1960	0.71	0.49
Rel Std Dev	81	5.1	2.5	10.1	0.68	31	1.6	10

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd (ppm)	Pb	Zn	Cr	As
ESG8404	56	19	7	1	366	900	<20	1.2
ESG8404	60	16.9	[illegible]	1	1020	940	<20	2.1
Std Dev	2.8	1.5	0	0	462	28	-	0.64
Rel Std Dev	4.9	8.3	0	0	67	3.1	-	39
ESG8413	58	34	7.5	2.6	250	800	28	1.5
ESG8413	57	33	6.5	2.8	157	780	25	1.5
Std Dev	0.71	0.71	0.71	0.14	66	14.1	2.1	0
Rel Std Dev	1.2	2.1	10.1	5.2	32	1.8	8	0
ESG8424	22	29	7.5	<1.0	11.7	27	21	1.3
ESG8424	21	28	7.4	<1.0	<10	25	18.9	1.6
Std Dev	0.71	0.71	0.07	-	-	1.4	1.5	0.21
Rel Std Dev	3.3	2.5	0.95	-	-	5.4	7.4	14.6
ESG8442	62	32	14.8	<1.0	242	780	28	5.3
ESG8442	66	38	17.7	<1.0	266	840	36	7.7
Std Dev	2.8	4.2	2.1	-	17	42	5.7	1.7
Rel Std Dev	4.4	12.1	12.6	-	6.7	5.2	17.7	26
ESG8452	61	47	15.8	<1.0	27	198	32	1.5
ESG8452	68	50	16	<1.0	32	238	31	3.7
Std Dev	4.9	2.1	0.14	-	3.5	28	0.71	1.6
Rel Std Dev	7.7	4.4	0.89	-	12	13	2.2	60
ESG8465	72	98	19.6	<1.0	12.2	98	32	2.5
ESG8465	73	99	21	<1.0	12.2	93	30	2.5
Std Dev	0.71	0.71	0.99	-	0	3.5	1.4	0
Rel Std Dev	0.98	0.72	4.9	-	0	3.7	4.6	0

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd (ppm)	Pb	Zn	Cr	As
ESG8472	38	50	12.5	<1.0	12.2	87	30	1.1
ESG8472	41	51	11.6	<1.0	12.2	98	24	0.99
Std Dev	2.1	0.71	0.64		0	7.8	4.2	0.08
Rel Std Dev	5.4	1.4	5.3		0	8.4	15.7	7.4
ESG8475	42	77	17	<1.0	10.5	121	19.9	1.2
ESG8475	40	76	16.1	<1.0	<10	124	22	1.2
Std Dev	1.4	0.71	0.64		-	2.1	1.5	0
Rel Std Dev	3.4	0.92	3.8		-	1.7	7.1	0
ESG7502	<3.0	<5.0	<5.0	<1.0	19.5	108	<20	0.19
ESG7502	<3.0	<5.0	<5.0	<1.0	27	105	<20	<0.2
Std Dev	-	-	-		5.3	2.1	-	-
Rel Std Dev	-	-	-		23		-	-
ESG7514	27	14.4	<5.0	<1.0	46	187	21	0.31
ESG7514	30	12.8	<5.0	<1.0	40	182	21	0.32
Std Dev	2.1	1.1	-		4.2	3.5	0	0.01
Rel Std Dev	7.4	8.3	-		9.9	9	0	2.2
ESG7521	19.3	16.5	<5.0	<1.0	339	179	30	0.39
ESG7521	19.4	14.4	<5.0	<1.0	360	195	24	0.49
Std Dev	0.07	1.5	-		14.8	11.3	4.2	0.07
Rel Std Dev	0.37	9.6	-		4.2	6.1	15.7	16.1
ESG7536	32	33	11.9	<1.0	20	309	58	0.4
ESG7536	33	31	13.8	<1.0	20	195	58	0.64
Std Dev	0.71	1.4	1.3	-	0	81	0	0.17
Rel Std Dev	2.2	4.4	10.5		0	32	0	33

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd (ppm)	Pb	Zn	Cr	As
ESG7550	30	42	8.9	<1.0	<10	71	67	0.4
ESG7550	24	47	7.9	<1.0	<10	62	67	0.25
Std Dev	4.2	3.5	0.71	-	-	6.4	0	0.11
Rel Std Dev	15.7	7.9	8.4	-	-	9.6	0	33
ESG7563	6	<5.0	<5.0	<1.0	3820	190	<20	<0.2
ESG7563	6.7	7.8	<5.0	<1.0	3420	193	<20	<0.2
Std Dev	0.49	.		-	283	2.1	-	-
Rel Std Dev	7.8	.	.	-	7.8	1.1	-	-
ESG7581	8.9	12.3	<5.0	<1.0	40	41	23	<0.2
ESG7581	8.3	11.4	<5.0	<1.0	44	39	<20	<0.2
Std Dev	0.42	0.64	.	-	2.8	1.4	-	-
Rel Std Dev	4.9	5.4	-	-	6.7	3.5	-	-
ESG7591	12.8	15.2	5.6	<1.0	<10	33	27	<0.2
ESG7591	12.9	15.2	5.6	<1.0	<10	33	27	<0.2
Std Dev	0.07	0	-	-	-	0	0	-
Rel Std Dev	0.55	0	-	-	-	0	0	-
ESG7605	13.5	17.1	6.5	<1.0	19.9	39	30	<0.2
ESG7605	13.8	18.6	6.3	<1.0	23	41	31	<0.2
Std Dev	0.21	1.1	0.14	-	2.2	1.4	0.71	-
Rel Std Dev	1.6	5.9	2.2	-	10.2	3.5	2.3	-
ESG7614	17.8	29	8.5	<1.0	12.9	41	49	0.49
ESG7614	19.9	28	7.6	<1.0	14.7	41	46	0.78
Std Dev	1.5	0.71	0.64	-	1.3	0	2.1	0.21
Rel Std Dev	7.9	2.5	7.9	-	9.2	0	4.5	32

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
				(ppm)				
ESG7631	21	11.3	<5.0	<1.0	21	237	28	0.4
ESG7631	18.9	10.3	<5.0	<1.0	10.5	211	22	0.25
Std Dev	1.5	0.71	-		7.4	18.4	4.2	0.11
Rel Std Dev	7.4	6.5	-		47	8.2	17	33
ESG7643	56	57	14.8	<1.0	112	126	90	0.79
ESG7643	51	54	14.7	<1.0	10.3	113	88	0.49
Std Dev	3.5	2.1	0.07		72	9.2	1.4	0.21
Rel Std Dev	6.6	3.8	0.48	.	118	7.7	1.6	33
ESG7656	15.9	11.2	<5.0	<1.0	<10	[illegible]	<20	<0.2
ESG7656	12.5	10.2	<5.0	<1.0	<10	33	<20	<0.2
Std Dev	2.4	0.71	-		-	1.4	.	-
Rel Std Dev	16.9	6.6	-		-	4.2	.	-
ESG7660	<3.0	6.1	<5.0	<1.0	<10	9.6	<20	0.94
ESG7660	<3.0	6.1	<5.0	<1.0	<10	9.5	<20	0.94
Std Dev	-	0	-		-	0.07	.	0
Rel Std Dev	-	0	-		-	0.74	.	0
ESG7639	26	22	<5.0	<1.0	28	47	29	0.39
ESG7639	29	17	<5.0	<1.0	16.6	49	[illegible]	0.4
Std Dev	2.1	3.5	-	-	8.1	1.4	1.4	0.01
Rel Std Dev	7.7	18.1	-		36	2.9	4.7	1.8
ESG7714	4.4	<5.0	<5.0	<1.0	16.2	[illegible]	<20	0.44
ESG7714	4.4	<5.0	<5.0	<1.0	19.5	29	<20	0.44
Std Dev	0	-	-		2.3	2.8	-	0
Rel Std Dev	0	-	-		13.1	10.5	-	0

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd (ppm)	Pb	Zn	Cr	As
ESG7722	12.5	8.5	5.6	<1.0	<10	42	<20	0.49
ESG7722	12.6	8.5	5.6	<1.0	10.7	43	<20	0.64
Std Dev	0.07	0	0	-	-	0.71	-	0.11
Rel Std Dev	0.56	0	0	-	-	1.7	-	18.8
ESG7743	56	6.2	<5.0	<1.0	29	64	<20	0.59
ESG7743	57	6.2	<5.0	<1.0	27	68	<20	0.44
Std Dev	0.71	0		-	1.4	2.8	-	0.11
Rel Std Dev	1.3	0	-	-	5.1	4.3	-	21
ESG7751	13.9	<5.0	<5.0	<1.0	21	93	<20	<0.2
ESG7751	8.3	<5.0	<5.0	<1.0	21	95	<20	0.29
Std Dev	4	-	-	-	0	1.4	-	-
Rel Std Dev	36	-	-	-	0	1.5	-	-
ESG7775	6.2	<5.0	<5.0	<1.0	25	24	<20	0.59
ESG7775	6.2	<5.0	<5.0	<1.0	15.3	22	<20	0.59
Std Dev	0	-		-	6.9	1.4	-	0
Rel Std Dev	0	-	-	-	34	6.1	-	0
ESG7788	46	5.2	<5.0	<1.0	132	138	<20	5
ESG7788	39	5.2	<5.0	<1.0	85	102	<20	4.2
Std Dev	4.9	0		-	33	25	-	0.57
Rel Std Dev	11.6	0		-	31	21	-	12.3
ESG7702	5.7	7	<5.0	<1.0	<10	31	<20	0.74
ESG7702	6.4	8	<5.0	<1.0	<10	30	<20	0.49
Std Dev	0.49	0.71	-	-	-	0.71	-	0.18
Rel Std Dev	8.2	9.4		-	-	2.3	-	29

Table B-4: Inorganic Element Results for Soil and Sediment Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
				(ppm)				
ESG7792	<3.0	<5.0	<5.0	<1.0	<10	19.9	<20	0.25
ESG7792	<3.0	<5.0	<5.0	<1.0	<10	19.2	<20	0.25
ESG7792	<3.0	<5.0	<5.0	<1.0	<10	19.1	<20	0.25
Std Dev	-	-	-		-	0.44	.	0
Rel Std Dev	-	-	-		-	2.2	-	0
ESG7757	22	5.5	<5.0	<1.0	43	69	<20	0.45
ESG7757	22	6.6	<5.0	<1.0	40	66	<20	0.55
Std Dev	0	0.78	-	-	2.1	2.1	-	0.07
Rel Std Dev	0	12.9	-	-	5.1	3.1	-	14.1
ESG7796	6.7	<5.0	<5.0	<1.0	120	76	<20	0.39
ESG7796	8.2	<5.0	<5.0	<1.0	104	109	<20	0.4
Std Dev	1.1	-	-	.	11.3	23	.	0.01
Rel Std Dev	14.2	-	-		10.1	25	.	1.8
ESG7795	4.6	<5.0	<5.0	<1.0	<10	22	<20	0.3
ESG7795	7.6	<5.0	<5.0	<1.0	<10	25	<20	0.3
Std Dev	2.1	-	-		-	2.1	.	0
Rel Std Dev	35	-	-	.	-	.		0
Average Rel Std Dev (n=40)	**9.9**	**4.8**	**4.2**	**3.1**	**19.6**	**7.9**	**5.5**	**16.6**
Std Dev	**± 15.3**	**± 4.5**	**± 4.1**	**± 4.5**	**± 25**	**± 8.9**	**± 5.9**	**± 16.2**

Table B-5: Inorganic Element Results for Plant and Paint Chip Analytical Replicates

Sample	Cu	Ni	Co	Cd	Pb	Zn	Cr	As
				(ppm)				
PLANTS								
ESG8467P	418	82	5.2	41	408	1500	124	0.57
ESG8467P	388	66	4.7	37	355	1440	97	0.5
Std Dev	21	11.3	0.35	2.8	37	42	19.1	0.05
Rel Std Dev	5.3	15.3	7.1	7.3	9.8	2.9	17.3	9.3
ESG7652P	7.6	9.4	<5	0.94	<15	195	10.9	<0.2
ESG7652P	6.9	8.3	<5	0.94	<15	198	10.9	<0.2
Std Dev	0.49	0.78	-	0	-	2.1	0	-
Rel Std Dev	6.8	8.8	-	0	-	1.1	0	-
ESG7603P	6.7	9.1	<	3.1	<15	333	<10	<0.2
ESG7603P	6.7	8.1	<	3	<15	332	<10	<0.2
Std Dev	0	0.71		0.07	-	0.71	-	-
Rel Std Dev	0	8.2	-	2.3	-	0.21	-	-
ESG7606P	10.3	<5	<	9.2	<15	1140	<10	<0.2
ESG7606P	9.7	<5	<5	9.4	<15	1160	<10	<0.2
ESG7606P	9.7	<5	<5	9.4	<15	1100	<10	<0.2
Std Dev	0.35	-	-	0.12	-	31	-	-
Rel Std Dev	3.5	-		1.2	-	2.7	-	-
ESG7516P	27	39	<5	0.97	1560	217	98	1.1
ESG7516P	25	44	<5	1.2	1100	215	112	1.8
ESG7516P	25	44	<5	1	1100	193	104	1.2
ESG7516P	26	51	<5	1	1440	215	121	1.3
Std Dev	0.96	4.9		0.11	236	11.4	10	0.31
Rel Std Dev	3.7	11.1		10.2	18.2	5.4	9.2	23

Table B-5: Inorganic Element Results for Plant and Paint Chip Analytical Replicates (cont'd)

Sample	Cu	Ni	Co	Cd (ppm)	Pb	Zn	Cr	As
ESG7793P	7.8	6.6	<5	0.97	<15	223	11.6	<0.2
ESG7793P	7.4	6.6	<5	0.87	<15	247	10.5	<0.2
Std Dev	0.28	0	-	0.07	-	17	0.78	-
Rel Std Dev	3.7	0	-	7.7	-	7.2	-	-
Average Rel Std Dev	**3.8**	**8.7**	**7.1**	**4.8**	**14**	**3.3**	**8.4**	**16.2**
Std Dev	**± 2.3**	**± 5.6**	-	**± 4.1**	**± 5.9**	**± 2.6**	**± 7.1**	**± 9.7**
PAINT CHIPS								
Radio PC-1					73644			
Radio PC-1					91827			
Std Dev					**12860**			
Rel Std Dev					**15.5%**			