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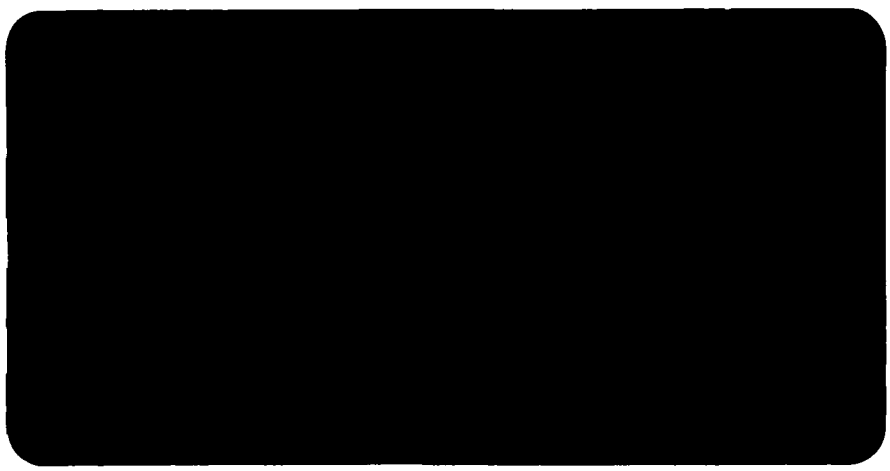

ENVIRONMENTAL ENGINEERING SPECIALISTS

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SPECIALISTS

XCG File #5-997-01-04

May 18, 1999

DRAFT

ADDITIONAL PHASE 2 ENVIRONMENTAL SITE ASSESSMENT 3241 WALDEN AVENUE DEPEW, NEW YORK

5-18-99

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APPENDICES

1. INTRODUCTION

1.1 Project Background

In April 1999, XCG Consultants Ltd. (XCG) was retained by Norampac, Inc. (Norampac) to carry out an Additional Phase 2 Environmental Site Assessment (ESA) of the property located at 3241 Walden Avenue in Depew, New York. This study follows XCG's Limited Phase 2 ESA, which was conducted between October 1998 and February 1999. This initial study focused on the former lagoon and marsh, and immediate surrounding area (i.e. central portion of the property). XCG conducted the Additional Phase 2 ESA with the assistance and local support of Parsons Engineering Science, Inc. (Parsons), which is based in Williamsville, New York.

1.2 Objectives and Scope of Work

The overall objective of this Additional Phase 2 ESA was to further characterize the subsurface environmental conditions, at other exterior locations on the property not previously investigated (i.e. west side of the site, trucking area, rail siding, and parking area at east side of property). Specifically, the objectives of the additional Phase 2 ESA are as follows:

- Delineate the lateral and vertical extent of metals impacted fill soils;
- Further characterize the soil waste classification throughout the site;
- Develop site-specific background values, if possible; and
- Obtain additional groundwater samples for analyses to further characterize the site.

The field work was conducted in accordance with XCG's letter proposal under the title "Proposed Work Plan for Additional Phase 2 Environmental Site Assessment, 3241 Walden Avenue, Depew, New York," dated April 1, 1998. This final work plan incorporated the New York State Department of Environmental Conservation's (NYSDEC) comments on XCG's Draft proposed work plan (e.g. collect surficial grab samples along north property line). Minor modifications were made based on site observations during implementation of the field work. The final scope of work completed at the subject site included the following:

- Clearance of underground public utility services by the drilling contractor;
- Advancing one monitoring well at the northeast corner of the property (i.e. parking area) and two monitoring wells at the west side of the site (i.e. west of the tree and marsh plant covered area). Monitoring wells were

installed to investigate the shallow groundwater quality at the east and west sides of the property. Monitoring wells installed in this investigation are identified with a "MW99" prefix and their locations are shown on Figure 1;

- Advancing seven shallow boreholes at the west side of the site to investigate the fill and underlying native silty clay quality. Boreholes advanced in this investigation are identified with a "BH99" prefix;
- Advancing eight shallow boreholes in the trucking area (i.e. gravel covered area located west of on-site building) to investigate the fill and underlying native silty clay quality;
- Advancing four shallow boreholes along the rail siding (i.e. south side of building) to investigate the fill and underlying native silty clay quality;
- Advancing two shallow boreholes in the paved parking lot area (i.e. east side of site) to investigate the fill and underlying native silty clay quality.
- Collecting surface fill samples at twelve locations along the north property line.
- Field characterization of soil samples by visual and olfactory inspection, and by screening with a field photoionization detector (i.e. HNu), which measures total organic vapours (TOV) in the parts per million (ppm) range;
- Submitting 19 fill soil samples from the borehole locations for laboratory analyses of metals. Two of these soil samples were submitted as blind field duplicates for quality assurance/quality control (QA/QC) purposes. In addition, 5 of these fill samples were analyzed for polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs). The soil sampling program is summarized in Section 3.2 (Table 1);
- Submitting 13 surface fill samples (including 1 duplicate QA/QC sample) for laboratory analyses of metals;
- Submitting 10 fill samples for Toxicity Characteristic Leaching Procedure (TCLP) analysis, to identify the soil waste classification (i.e. hazardous or not);
- Submitting 13 native silty clay samples for laboratory analyses of metals;
- Collecting and submitting a groundwater sample from each of the three monitoring wells for laboratory analyses of metals. In addition, one of the groundwater samples was split into two samples, with one portion submitted as a blind duplicate for QA/QC purposes; and
- Preparing a report outlining the subsurface environmental conditions at the investigated locations on the subject property.

RESIDENTIAL

RESIDENTIAL

COMMERCIAL

WEST THIRD STREET

RESTAURANT

RESIDENTIAL

WEST SECOND STREET

WALDEN AVENUE (FORMERLY ELLICOTT ROAD)

SANITARY MANHOLE

NON-FERROUS METAL CASTING CO.

NON-FERROUS VEHICLES

UNDEVELOPED

UNDEVELOPED

NON-FERROUS CONSTRUCTION EQUIPMENT

VEGETATIVE GROWTH (WEEDS)

TREE

MARSH-TYPE PLANTS

TREES

TREES

TREES

ESTIMATED DIRECTION OF SHALLOW GROUNDWATER FLOW

672.57

675.85

GRAVEL

OVERHEAD POWER LINES

GARAGE

TRUCK SCALE

GRAVEL

GRAVEL

PLANT AND OFFICE BUILDING

CONCRETE APRON

BH99-1 740

BH99-2 11,000

BH99-3 880

BH99-4 20,000

BH99-5

BH99-6 210

BH99-7 8,400 (17)

BH99-8 520

BH99-9 31,000

BH99-10 18,000

BH99-11

BH99-12

BH99-13 25,000

BH99-14 4,900 (25)

BH99-15 13,000

BH99-16

BH99-17 7,700

BH99-18 1,900

BH99-19 19,000

BH99-20 22,000

BH99-21 6,000

BH98-1 86,000 (210)

BH98-2 45,000

BH98-3 7,900

BH98-4 5,200

BH98-5 21,000

BH98-6 16,000

BH98-7 8,400

BH98-8 7,700 (21)

BH98-9 4,700

BH98-10 15,000 (89)

MW99-1 675.47

MW99-2 667.97 (8.7)

MW99-3 670.98 (170)

MW98-1 673.89 20,000 (240)

MW98-2 677.08 1,500

MW98-3 671.74 39,900

MW98-4 675.46

SURF1 5,400

SURF2 1,800

SURF3 11,000

SURF4 10,000

SURF5 7,100

SURF6 4,900

SURF7 5,300

SURF8 2,600

SURF9 330

SURF10 440

SURF11 290

SURF12 280

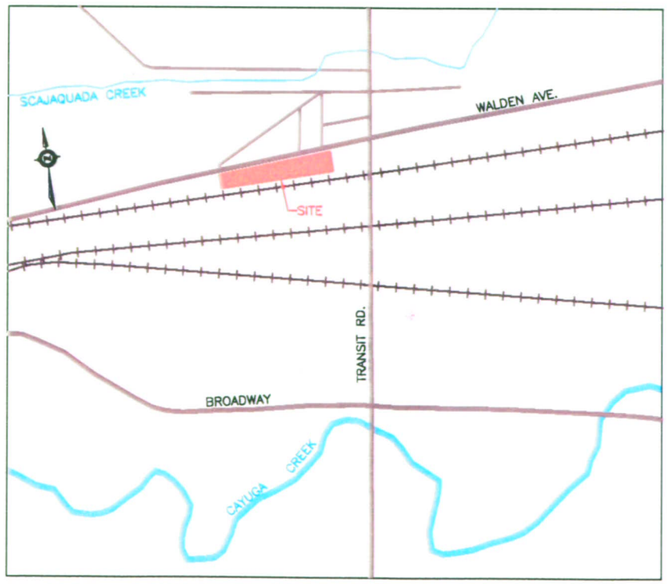
APPROXIMATE EXTENT OF FORMER MARSH AREA

UW (UNKNOWN HISTORICAL WELL)

APPROXIMATE EXTENT OF FORMER LAGOON

NEW YORK CENTRAL RAILROAD

HUDSON RIVER RAILROAD CO.



KEYMAP (not to scale)

LEGEND:

PROPERTY BOUNDARY

FENCE

MW98-4 APPROXIMATE EXISTING MONITORING WELL LOCATION

BH98-4 APPROXIMATE EXISTING BOREHOLE LOCATION

SURF12 SURFACE GRAB SAMPLE LOCATION

1,600 LEAD CONCENTRATION (ppm) IN FILL MATERIAL (OCTOBER & DECEMBER 1998)

7,700 LEAD CONCENTRATION (ppm) IN FILL MATERIAL (APRIL 1999)

671.74 GEODETIC GROUNDWATER ELEVATION (ft) (APRIL 14&15, 1999)

672.57 GEODETIC GROUNDWATER ELEVATION CONTOURS (ft) (APRIL 14&15, 1999)

(89) TCLP LEAD mg/l

SCALE:

0 20 40 60m

0 100 200 ft.

DRAWING REFERENCE: Based on survey drawing by Norampac, Inc. (Millard & McKay)

NOTE: Locations of buildings, underground utilities, etc. are for reference only and should not be relied upon for detail design, excavation, or construction purposes.

(file: 5997\01\WALDEN04.DWG)

BOREHOLE LOCATION PLAN

ADDITIONAL PHASE 2 ESA
3241 WALDEN AVE.
DEPEW, NEW YORK

XCG CONSULTANTS LTD.

DATE	JOB NO.	FIGURE NO.
MAY. 1999	5997-01.04	1

2. SITE DESCRIPTION

2.1 Site Background

The subject site is located at 3241 Walden Avenue in Depew, New York. It is situated on the south side of Walden Avenue, approximately 107 metres (350 feet) west of Transit Road. The site is located in a mixed commercial/industrial and residential area. Commercial/industrial properties adjoin the east and west sides of the subject site. Residential properties are predominantly located across the street, on the north side of Walden Avenue. A New York Central Railway line borders the south property line. This railway line is elevated by a berm approximately 1.2 to 1.5 metres (4 to 5 feet) high. XCG understands that the subject site will continue to be used for industrial purposes.

The property is approximately 2.63 hectares (6.5 acres) in size, of which approximately half is developed. There is one main building located on the east side of the subject property and a small garage situated to the west, at the north property line. Truck loading and unloading operations and trailer parking are conducted on the west side of the plant building. This area is surfaced with gravel and is surrounded by a chain-link fence. The area to the west of the trucking area is undeveloped. The east side of the site is paved with asphalt and is used for employee parking.

XCG conducted a Limited Phase 2 ESA between October 1998 and February 1999. This initial subsurface investigation was conducted to address the concerns raised by the NYSDEC regarding historical environmental impacts located in the area of a former on-site lagoon and marsh (i.e. heavy metals and a release of No. 2 fuel oil in the lagoon). The lagoon and marsh were located near the central part of the property, along the south property line.

The Limited Phase 2 ESA consisted of drilling 10 boreholes, installing 4 groundwater monitoring wells, and soil and groundwater sampling. This study focused primarily in the former lagoon and marsh, and immediate surrounding area (i.e. central portion of the property). The field investigation activities were conducted between October and December 1998. Drilling locations from the initial investigation are shown on Figure 1 and are identified with a "MW98" or "BH98" prefix. Soil samples from the fill and native silty clay strata were analyzed for various parameters including metals, TCLP metals, VOCs, and PAHs while groundwater samples were analyzed for metals, PAHs, VOCs, and anions.

The analytical results indicated that concentrations of select metals (e.g. lead, copper, zinc) in the fill material exceeded the NYSDEC's TAGM 4046 Cleanup Objectives, or Eastern USA/New York State Background Values for metals where Cleanup Objectives have not been established. TCLP metals analyses indicated

that the fill material in some areas is hazardous, according to 6NYCRR Part 371 (i.e. lead concentrations in leachate exceeding 5 mg/L). The concentrations of lead, copper, and zinc in the native silty clay layer were much lower than those detected in the fill material. As such, the silty clay appears to be acting as an effective barrier to vertical migration of contaminants. Visual and faint olfactory evidence of petroleum hydrocarbons were found in the fill material at the former lagoon and marsh. These observations were verified by analytical results, which showed concentrations of select VOCs and PAHs exceeding the NYSDEC STARS1 TCLP Alternative Guidance Values. In the groundwater samples, select metals exceeded the NYSDEC TOGS 1.1.1 Standards or Guidance Values (e.g. magnesium, sodium, and one sample for lead). In addition, select PAHs in groundwater from one monitoring well exceeded the TOGS 1.1.1 Guidance Values.

Details of the Limited Phase 2 ESA are provided in XCG's Draft report entitled "Limited Phase 2 Environmental Site Assessment, 3241 Walden Avenue, Depew, New York" dated February 10, 1999. Copies of this report have been provided to the NYSDEC.

A brief history of the subject property was provided in XCG's Limited Phase 2 ESA report. In addition, XCG is in the process of completing a Limited Phase 1 ESA, which is focused on reviewing historical information on the subject property. Norampac authorized XCG to conduct this work after the commencement of the Additional Phase 2 ESA.

As mentioned previously, the Limited Phase 2 ESA focused primarily on the former lagoon and marsh, and immediate surrounding areas. This area is undeveloped and is considered as the central portion of the property. The central area is approximately defined to the east by the chain link fence on the west side of the trucking area and by the west side of the trees and marsh plant covered area to the west (see Figure 1). The area between this vegetation and the west property line is defined as the west side of the site. The west side of the site is undeveloped and is covered with imported fill, including construction debris (i.e. brick and large concrete fragments). This fill is discussed briefly in XCG's Limited Phase 2 ESA Report. Domtar Fiber Products Inc., the previous property owner, retained Ferry Construction Co. Inc. (neighbour to the west) in the late 1970s to early 1980s to fill in the west side of the site. XCG is not aware of the source of this fill material. The current investigation was conducted at the west side of the property, in addition to the trucking area, rail siding, and east side of the site (i.e. paved parking area) to delineate the extent of metals impacts. The trucking area is defined by the west side of the on-site building and the chain link fence surrounding the gravel covered area. The rail siding is located between the south side of the on-site building and the chain link fence on the south property line, and extends the width of the building. The east side of the property consists of the

paved parking area between the on-site building and the adjacent building to the east.

NYSDEC requested that XCG obtain information regarding prevailing wind direction in the area of the subject site. The Buffalo, New York National Weather Service web site has meteorological climate summaries for Buffalo, but not Depew. The prevailing wind direction for the Buffalo area is predominantly from the southwest.

3. FIELD INVESTIGATION

The field investigation activities were conducted on April 8, 9, 14, and 15, 1999. XCG's field activities were supervised by Mr. Basil Wong, P.Eng. A description of the field investigation methodology used is provided below.

3.1 Drilling Investigation

The subsurface investigation consisted of a shallow borehole drilling and monitoring well installation program. The boreholes and monitoring wells were placed at relatively even spaced locations at each investigated area, in order to properly delineate the extent of metals impacts.

Monitoring wells were installed using a truck-mounted Acker Soilmax drilling rig. XCG subcontracted the drilling operations to Maxim Technologies, Inc. (Maxim) of Hamburg, New York, who conducted the work under the full-time supervision of XCG personnel. Three boreholes were advanced with the drilling rig and completed as monitoring wells. Monitoring well locations are shown on Figure 1, and the borehole logs are provided in Appendix A.

The shallow boreholes were advanced using a direct push drilling rig (Geoprobe). In total, 21 shallow boreholes were advanced, of which 7 were located at the west side of the property, 8 in the trucking area, 4 along the rail siding, and 2 were located at the east side of the site. XCG also retained Maxim to carry out these shallow drilling activities.

3.2 Soil Sampling Methodology

Borehole drilling with the truck-mounted CME-75 drilling rig was conducted with hollow-stem augers. Soil sampling was performed at continuous 0.6 metre (2 feet) intervals to a depth of at least 2.4 metres (8 feet). Beyond this depth, the soil samples were obtained less frequently as the boreholes had advanced beyond the fill and native silty clay contact. A 0.6 metre (2 feet) long, 0.05 metre (2 inch) diameter, stainless steel split-spoon sampler was used to collect the soil samples. A standard penetration test (SPT) was performed during the collection of each sample. The boreholes drilled for monitoring well installation were advanced to depths ranging from approximately 4.1 to 7.3 metres (13.5 to 24 feet) below ground surface.

Soil sampling with the Geoprobe was performed continuously with a 1.2 metre (4 feet) long, 0.05 metre (2 inch) diameter, stainless steel cylindrical sampler. The sampler's interior was lined with a plastic sleeve for soil collection. The Geoprobe

boreholes were advanced to depths just beyond the fill and native silty clay interface, to minimize the vertical pathway for potential migration. These depths ranged from approximately 0.6 to 2.4 metres (2 to 8 feet) below grade.

Surface grab samples were collected manually. A stainless steel shovel was used to excavate a small hole at ground surface. The soil samples were then collected from the wall of the hole with a stainless steel trowel at a depth of 0 to 0.05 metres (0 to 2 inches).

Hollow-stem augers were decontaminated with a steam cleaner between borehole locations to prevent cross-contamination. Further, the split-spoon samplers, Geoprobe sampler, shovel, and trowel were decontaminated between each sampling point with clean water and detergent. A new plastic sleeve was used for each Geoprobe sampling point to further prevent cross-contamination.

Soil samples were visually classified and logged for stratigraphy, soil structure, and evidence of contamination. All soil samples were placed in labelled plastic sample bags. Headspace vapours in the sample bags were screened for TOV readings using a field photoionization detector (i.e. HNu meter). TOV readings in parts per million (ppm) for each soil sample are included in the borehole logs (see Appendix B).

Selection of initial soil samples for laboratory analyses was based on visual and olfactory evidence, sample depth, and TOV measurements in an effort to identify "worst case" samples (i.e. fill material). In addition, the number of fill samples submitted for laboratory analyses were allocated relatively evenly for each investigated area, in order to obtain a site-wide distribution of analytical data. Based on the analytical results of the worst case fill samples, subsequent analysis of the underlying silty clay soil was conducted. In addition, the analytical results of total metals in the fill material were used to determine which samples to analyze for TCLP metals, in order to provide a range of leachate results (i.e. TCLP analyses for low to high concentrations of total lead). The field observations at the various boreholes are described below and the analytical program is summarized in Table 1.

The selected soil samples, which were stored in sample glass jars with teflon-lined lids, were placed in coolers (containing ice/cooler packs) and picked-up by Philip Analytical Services Corp. (PASC) of Burlington, Ontario, within approximately 24 hours of sample collection. The native silty clay samples were also stored at the laboratory until it was instructed to conduct the second round of analysis. PASC's Burlington laboratory is certified with the New York State Department of Health (ELAP Certification, ID#10756).

TABLE 1
SUMMARY OF SOIL AND GROUNDWATER SAMPLING PROGRAM

LOCATION	DEPTH		SOIL	PARAMETERS	
	(metres)	(feet)	TYPE	Soil	Groundwater
West Side of Property					
MW99-2	N/A	N/A	N/A	N/A	Metals
MW99-3	N/A	N/A	N/A	N/A	Metals
BH99-1	0-0.9	0-3	fill	Metals, TCLP metals	N/A
BH99-1	1.2-1.8	4-6	silty clay	Metals	N/A
BH99-2	0-1.1	0-3.5	fill	Metals	N/A
BH99-3	0-1.2	0-4	fill	Metals, TCLP metals	N/A
BH99-3	1.2-1.8	4-6	silty clay	Metals	N/A
BH99-4	0-0.9	0-3	fill	Metals	N/A
BH99-4	0.9-1.2	3-4	silty clay	Metals	N/A
BH99-6	0-0.9	0-3	fill	Metals, TCLP metals	N/A
BH99-7	0-0.9	0-3	fill	Metals, TCLP metals	N/A
BW1 (BH99-7 dup)	0-0.9	0-3	fill	Metals	N/A
BH99-7	0.9-1.2	3-4	silty clay	Metals	N/A
Trucking Area					
BH99-8	0-1.2	0-4	fill	Metals, TCLP metals	N/A
BH99-8	1.5-2.4	5-8	silty clay	Metals	N/A
BH99-9	0-1.2	0-4	fill	Metals	N/A
BW2 (BH99-9 dup)	0-1.2	0-4	fill	Metals	N/A
BH99-9	2.1-2.4	7-8	silty clay	Metals	N/A
BH99-10	0-0.9	0-3	fill	Metals, TCLP metals, VOCs, PAHs	N/A
BH99-11	1.2-1.8	4-6	silty clay	Metals	N/A
BH99-13	0-0.6	0-2	fill	Metals	N/A
BH99-14	0-0.6	0-2	fill	Metals, TCLP metals	N/A
BH99-19	0-1.2	0-4	fill	Metals, VOCs, PAHs	N/A
BH99-19	1.2-2.4	4-8	silty clay	Metals	N/A
Rail Siding					
BH99-15	0-1.2	0-4	fill	Metals, VOCs, PAHs	N/A
BH99-15	1.2-2.1	4-7	silty clay	Metals	N/A
BH99-17	0-1.2	0-4	fill	Metals, TCLP metals, VOCs, PAHs	N/A
BH99-17	1.2-1.8	4-6	silty clay	Metals	N/A
BH99-18	0-1.2	0-4	fill	Metals, TCLP metals, VOCs, PAHs	N/A
BH99-18	1.2-1.8	4-8	silty clay	Metals	N/A

TABLE 1
SUMMARY OF SOIL AND GROUNDWATER SAMPLING PROGRAM (cont'd)

LOCATION	DEPTH		SOIL	PARAMETERS	
	(metres)	(feet)	TYPE	Soil	Groundwater
East Side of Property (Parking Area)					
BH99-20	0-0.9	0-3	fill	Metals	N/A
BH99-20	0.9-1.2	3-4	silty clay	Metals	N/A
BH99-21	0-0.8	0-2.5	fill	Metals, TCLP metals	N/A
BH99-21	0.8-1.2	2.5-4	silty clay	Metals	N/A
MW99-1	N/A	N/A	N/A	N/A	Metals
BW4 (MW99-1 dup)	N/A	N/A	N/A	N/A	Metals
Surface Fill Samples Along North Property Line					
SURF 1	0-0.05	0-0.17	fill	Metals	N/A
SURF 2	0-0.05	0-0.17	fill	Metals	N/A
SURF 3	0-0.05	0-0.17	fill	Metals	N/A
SURF 4	0-0.05	0-0.17	fill	Metals	N/A
BW3 (SURF 4 dup)	0-0.05	0-0.17	fill	Metals	N/A
SURF 5	0-0.05	0-0.17	fill	Metals	N/A
SURF 6	0-0.05	0-0.17	fill	Metals	N/A
SURF 7	0-0.05	0-0.17	fill	Metals	N/A
SURF 8	0-0.05	0-0.17	fill	Metals	N/A
SURF 9	0-0.05	0-0.17	fill	Metals	N/A
SURF 10	0-0.05	0-0.17	fill	Metals	N/A
SURF 11	0-0.05	0-0.17	fill	Metals	N/A
SURF 12	0-0.05	0-0.17	fill	Metals	N/A

NOTES:

N/A not applicable or not analyzed
PAHs polycyclic aromatic hydrocarbons
MW monitoring well
VOCs volatile organic compounds
BH borehole

Boreholes BH99-1 to BH99-7 and monitoring wells MW99-2 and MW99-3 were located at the west side of the property (see Figure 1). The fill material was relatively consistent throughout this area and consisted of a sand and gravel with some silty clay, mixed with brick and concrete fragments. Relatively large concrete slab fragments were observed throughout the west side of the property. No visual or olfactory evidence of hydrocarbon odours were observed in this fill material. Since the fill material was similar throughout the west side of the site, representative samples from six of the nine drilling locations were submitted for laboratory analyses of metals (see Table 1). Based on the analytical results of the fill material, four of the six fill samples were analyzed for TCLP metals. In

addition, four samples of the native silty clay were analyzed for total metals to determine the vertical extent of impacts.

Boreholes BH99-8 to BH99-14 and BH99-19 were advanced in the trucking area. The fill in this area generally consisted of sand and gravel near surface, with varying percentages of sand, gravel, and silty clay fill with depth. Brick fragments were encountered at some of the boreholes. Refusal was encountered at BH99-10, BH99-13, and BH99-14, at depths of 0.9 metres (3 feet), 0.6 metres (2 feet), and 0.6 metres (2 feet), respectively. This may be the result of old foundations or buried large debris (e.g. waste concrete). Fill samples from six of the eight borehole locations were submitted for chemical analyses of metals. These samples were considered to be representative of the fill material in the trucking area. A mild hydrocarbon odour was detected at the bottom of the fill unit in BH99-10 and BH99-19. As such, soil samples from these borehole locations were also analyzed for VOCs and PAHs. Boreholes BH99-10 and BH99-19 are located towards the south side of the trucking area. Subsequent to the initial fill testing, three of the six fill samples were analyzed for TCLP metals and four native silty clay samples were analyzed for total metals.

Hydrocarbon odours and a slight sheen were observed in the fill material in the four boreholes drilled along the rail siding (BH99-15 to BH99-18). The depth of fill in this area ranged between approximately 0.9 and 1.2 metres (3 to 4 feet). Representative fill samples from three of the four boreholes were analyzed for metals, VOCs, and PAHs. Two of the three fill samples were also analyzed for TCLP metals to define its waste classification. In order to define the vertical extent of metals impacts along the rail siding, native silty clay samples from the three boreholes were analzyed for total metals.

Boreholes BH99-20 and BH99-21, and monitoring well MW99-1 were located in the parking area, at the east side of the site. The fill in this area did not exhibit any visual or olfactory evidence of petroleum impacts. The fill and native silty clay samples from the two boreholes were analyzed for metals. In addition, one of the fill samples was tested for TCLP metals..

3.3 Groundwater Investigation

Monitoring well locations are shown on Figure 1 and construction details are presented on the borehole logs (see Appendix A). In general, the monitoring wells were constructed with 50 millimetre (2 inch) diameter Schedule 40 PVC pipe. In MW99-1, the bottom 1.5 metres (5 feet) were screened with #10 slot PVC screen. A 3.0 metre (10 feet) screen was used for monitoring wells MW99-2 and MW99-3. The annulus between the borehole wall and screen was filled with #1 quartz sand to a depth of approximately 0.6 metres (2 feet) above the top of the

screen. A 0.6 metre (2 feet) thick bentonite seal was placed above the sand. The remaining annular space was backfilled with hand-mixed concrete. A steel flush-mount protective casing was constructed at ground surface for MW99-1 and MW99-2 while a steel stick-up protective casing was used for MW99-3. A J-plug and lock were provided for the monitoring wells equipped with flush-mount protective casings. The stick-up protective casing was locked on the outside of the casing.

Prior to groundwater sampling, the water levels in each new monitoring well were measured using an electronic water level indicator. Water levels in the previously installed monitoring wells were also measured. To prevent cross-contamination, the water level indicator was cleaned with detergent and distilled water after each measurement. The new monitoring wells were then developed to:

- Remove fine material from the sand pack and develop a good filter area around the well screen; and
- Ensure that a representative groundwater sample was obtained.

Monitoring well development was completed with dedicated WaTerra inertial lift tubing to prevent cross-contamination. The WaTerra system consists of a polyethylene foot valve installed in each well and connected to the surface with polyethylene tubing. Each monitoring well was developed by surging and purging the water in the well, using the dedicated WaTerra tubing. Three well volumes are typically removed during the well development process (a well volume is the amount of standing water in the pipe and surrounding sand backfill). However, due to the slow recovery, the wells were purged dry three times each before sampling. Monitoring well development was conducted on April 14, 1999. The third round of purging was conducted at the end of the day. The wells were then allowed to recover and were sampled for metals on April 15, 1999. In order to obtain representative samples, a dedicated disposal bailer was used to collect the groundwater samples as this method minimizes the agitation in the well. In accordance with the NYSDEC TAGM 4015 document under the title "Alteration of Groundwater Samples Collected for Metals," dated September 30, 1988, the groundwater samples were not field filtered and were immediately preserved with nitric acid ($pH < 2$).

A field water quality instrument was used to measure the changes in pH and turbidity in the groundwater during well development and at the time of sample collection. A Horiba Model U-10 Water Quality Checker was used for this purpose. The pH and turbidity readings in nephelometric turbidity units (NTU) are summarized in Table 2. The high turbidity readings during well development were likely a result of using WaTerra tubing, which causes a significant amount of agitation. As mentioned previously, a disposal bailer was used during sampling to

minimize the amount of agitation. The results in Table 2 show a significant reduction in the turbidity at the time of sampling. TAGM 4015 indicates that the groundwater turbidity should be less than 50 NTUs during sampling. This was accomplished in MW99-1 and MW99-2. However, the turbidity in MW99-2 was measured at 73 NTUs. This is likely a result of the shallow groundwater existing in a silty clay stratum.

TABLE 2
FIELD pH AND TURBIDITY MEASUREMENTS

MONITORING WELL #	pH DURING WELL DEVELOPMENT	pH AT SAMPLING	TURBIDITY DURING WELL DEVELOPMENT (NTUs)	TURBIDITY AT SAMPLING (NTUs)
MW99-1	7.51-8.15	7.78	>800	45
MW99-2	7.19-8.02	7.19	>800	73
MW99-3	7.43-8.11	7.40	>800	30

Groundwater samples were placed in laboratory supplied glass jars and stored in coolers (with ice packs) prior to delivery to PASC's laboratory for chemical analysis. The samples were picked-up by PASC within approximately 24 hours from collection. The groundwater analytical program is summarized in Table 1.

3.4 QA/QC Methods

Blind soil duplicate samples from BH99-7 [0 to 0.9 metres (0 to 3 feet)] and BH99-9 [0 to 1.2 metres (0 to 4 feet)] were analyzed for metals for QA/QC purposes. These samples were identified as BW1 and BW2, respectively. Also, a duplicate of surface fill sample SURF 4 (BW3) was analyzed for metals for QA/QC purposes. Further, a blind duplicate of the groundwater sample from MW99-1 (identified as BW4) was analyzed for metals. PASC also has a standard internal QA/QC program. As part of these procedures, a lab method blank, method spiked blank, matrix duplicate, matrix spike, and surrogates are analyzed during the testing of the samples. In addition, a laboratory duplicate of one soil and one groundwater sample is analyzed for every fourteen samples submitted. A laboratory duplicate analysis of metals was conducted for soil sample BH99-1 [0 to 0.9 metres (0 to 3 feet)], BH99-1 [1.2 to 1.8 metres (4 to 6 feet)], BH99-15 [0 to 1.2 metres (0 to 4 feet)], and BH99-19 [1.2 to 2.4 metres (4 to 8 feet)]. A laboratory duplicate analysis of PAHs was conducted for sample BH99-10 [0 to 0.9 metres (0 to 3 feet)]. A TCLP metals duplicate was conducted by the laboratory for samples BH99-1 [0 to 0.9 metres (0 to 3 feet)] and BH99-14 [0 to 0.6 metres (0 to 2.5 feet)]. In addition, a laboratory duplicate analysis of metals was performed on the groundwater sample from MW99-1.

4. APPLICABLE GUIDELINE CRITERIA

In New York State, there are three documents developed by the NYSDEC that are used to compare and assess analytical soil and groundwater data. These documents are summarized as follows:

- NYSDEC Spill Technology and Remediation Series Memo #1 (STARS1) under the title "Petroleum-Contaminated Soil Guidance Policy," dated August 1992 (reprinted July 1993);
- NYSDEC Division of Technical and Administrative Guidance Memorandum (TAGM) 4046 under the title "Determination of Soil Cleanup Objectives and Cleanup Levels," dated January 24, 1994 (revised); and
- NYSDEC's Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 under the title "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations," dated October 22, 1993 (reissued June 1998).

The STARS1 manual is used for the assessment and clean-up of sites impacted by petroleum spills. In this manual, there are four criteria that must be satisfied, in order to consider a soil to be not sufficiently contaminated. These are summarized as follows:

1. Protection of the groundwater;
2. Protection of human health;
3. Protection of fish and wildlife (not applicable at this site); and
4. Protection against objectionable nuisance characteristics.

Regional Spills Investigators of the NYSDEC indicated to XCG that their department's main focus is the protection of groundwater. This may be accomplished by comparing the analytical results of select VOCs and semi-volatile organic compounds (i.e. SVOCs, PAHs) in leachate extract, using the Toxicity Characteristic Leaching Procedure (TCLP), to the TCLP Guidance Values in either Table 1 (gasoline contaminated soil) or Table 2 (fuel oil contaminated soil) of STARS1. Alternatively, the analytical soil results can be compared to the TCLP Alternative Guidance Values. The alternative method was adopted in this study to assess the soil quality with respect to petroleum contaminants. The remaining VOCs and SVOCs that were tested, which do not have Guidance Values in STARS1, were compared to the Recommended Soil Cleanup Objectives in TAGM 4046.

The TAGM 4046 Recommended Soil Cleanup Objectives for certain metals provide the option of using either the specified value or using site Background Values. For other metals, the Cleanup Objective is the site Background Value. Fill samples from the southwest portion and east side of the property were initially intended to be used to develop site-specific Background Values. However, the analytical data (see Section 5.2) indicates that the fill in this area contains elevated levels of metals. As such, these samples are not considered to be appropriate for development of site-specific Background Values. Therefore, the analytical metal results were initially compared to the specified Cleanup Objectives (where available) or were compared to the Eastern USA/New York State Background Values. A range of Eastern USA and New York State Background Values for most metals are provided in TAGM 4046. Background values at the subject property and surrounding area are probably very high as it is located in an industrial area and is adjacent to a railway corridor. Therefore, site-specific Cleanup Objectives will need to be established and agreed to by Norampac and the NYSDEC. For the purpose of this report, the metals results were compared to values identified in TAGM 4046.

The TOGS 1.1.1 was used for comparison of the groundwater analytical results. TOGS 1.1.1 does not have Standards or Guidance Values for groundwater which is not used for potable purposes. The subject site and surrounding area is serviced by a municipal water supply, which draws its water from a surface water body. Therefore, the Standards and Guidance Values for groundwater used for drinking purposes were used for assessment. A Standard is a value that has been promulgated and placed into regulation. Guidance Values are used where a Standard has not been established.

5. RESULTS

5.1 Subsurface Conditions

5.1.1 On-Site Geology

West Side of Property

The overburden material encountered at the west side of the property consisted of a sand and gravel fill mixed with silty clay. The moisture content of the fill unit was observed to be generally moist. Small brick and concrete fragments, mixed in the fill, were encountered in the Geoprobe samplers. Larger concrete fragments were observed on the ground surface throughout the west side of the property. The depth of fill at the west side of the site was generally encountered between approximately 0.6 and 0.9 metres (2 to 3 feet), and was present to 1.2 metres (4 feet) at one of the borehole locations. Mr. Paul Ferry of Ferry Construction Inc. (3179 Walden Avenue, second neighbour to the west) stated that he was retained by Domtar in the late 1970s to early 1980s to fill in the area between the trees and marsh plants, and the west property line. Mr. Ferry stated that the fill was imported but he did not indicate its source. The fill unit is underlain by a native silty clay stratum. Occasional pebbles and gravel are present in the silty clay. This soil unit is reddish-brown to mottled grey/brown in colour and becomes grey with depth. The moisture content was typically damp in the upper zones of the silty clay. The consistency of this soil unit increased from very stiff to hard with depth. The colour changed to grey and the consistency became less hard as the depth approached the shallow water zone (approximately 4.3 metres (14 feet) below ground surface).

Trucking Area

In the trucking area, the fill consisted of sand and gravel at the surface. The fill became a mixture of sand, gravel, and silty clay with depth and was saturated with water. The depth of fill generally ranged between approximately 1.2 and 1.5 metres (4 to 5 feet) below grade. Geoprobe sampler refusal was encountered in boreholes BH99-10, BH99-13, and BH99-14 at depths of 0.9 metres (3 feet), 0.6 metres (2 feet), and 0.6 metres (2 feet), respectively. Refusal may have been caused by old foundations or buried construction debris (e.g. waste concrete). A mild hydrocarbon odour was encountered at the bottom of the fill in boreholes BH99-10 and BH99-19. The fill unit was underlain by a silty clay stratum.

Rail Siding Area

The overburden material along the rail siding consisted of rail ballast underlain by a sand and gravel, and silty clay fill. The fill material was dark brown to black in colour and was saturated with water. A mild to moderate hydrocarbon odour and oily sheen was present in the fill material in all boreholes advanced along the rail siding (BH99-15 to BH99-18). The fill material in the rail siding area was encountered at a depth range of between approximately 0.9 to 1.2 metres (3 to 4 feet). The underlying silty clay stratum did not exhibit any visual or olfactory evidence of petroleum hydrocarbons.

East Side of Property

The parking area at the east side of the property is surfaced with asphalt, approximately 8 centimetres (3 inches) thick. The depth of the underlying coarse sand with gravel fill ranged between approximately 0.5 and 0.75 metres (1.5 to 2.5 feet) below ground surface. The fill unit was underlain by silty clay, similar to other borehole locations on the property. Split-spoon refusal was encountered at a depth of approximately 4.1 metres (13.5 feet) below ground surface in MW99-1, which was located at the northeast corner of the property. Maxim attempted several times to auger past this depth but was unsuccessful.

5.1.2 On-Site Hydrogeology

The depths to groundwater in the newly installed monitoring wells were measured on April 14, 1999, prior to well development. However, measurements were not collected in MW99-3 as the well purging was inadvertently started before measuring. On April 15, 1999, the groundwater levels were again measured in these monitoring wells, in addition to the wells installed in the initial investigation. The monitoring wells were surveyed to a geodetic benchmark, which was provided by the New York State Department of Transportation. The groundwater depths and elevations are summarized in Table 3. Based on these measurements, the shallow groundwater is estimated to flow in a northwesterly direction toward Scajaquada Creek. Scajaquada Creek is located approximately 0.4 kilometres (0.25 miles) to the north of the subject site while Cayuga Creek is situated approximately 1 kilometre (0.62 miles) to the south.

TABLE 3
GROUNDWATER MEASUREMENTS

MONITORING WELL #	DEPTH TO WATER April 14, 1999		ELEVATION April 14, 1999		DEPTH TO WATER April 15, 1999		ELEVATION April 15, 1999	
	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(ft)
MW99-1 (flushmount)	1.26	4.13	205.723	674.94	1.10	3.01	205.883	675.47
MW99-2 (flushmount)	2.73	8.96	203.598	667.97	2.94	9.65	203.388	667.28
MW99-3 (stick-up)	N/M	N/M	N/M	N/M	2.685	8.81	204.515	670.98
MW98-1 (stick-up)	N/M	N/M	N/M	N/M	0.645	2.12	205.403	673.89
MW98-2 (stick-up)	N/M	N/M	N/M	N/M	0.88	2.89	206.373	677.08
MW98-3 (stick-up)	N/M	N/M	N/M	N/M	2.48	8.14	204.745	671.74
MW98-4 (flushmount)	N/M	N/M	N/M	N/M	0.55	1.80	206.185	676.46

NOTE:

N/M not measured

5.2 Soil Results

In total, 44 soil samples were submitted to PASC for analyses of various parameters including metals, PAHs, VOCs, and TCLP metals. A summary of the analytical results is presented in Tables 4 to 9. Copies of the Certificates of Analyses from PASC are included in Appendix B.

West Side of Property

The analytical results for metals in the fill material are presented in Table 4. Select samples from the west side of the property were initially planned to be used to develop site-specific Background Values. However, the analytical data has shown that historical activities have impacted this part of the site. Therefore, site-specific Background Values could not be developed with on-site samples. Soil samples from BH99-1 [0 to 0.9 metres (0 to 3 feet)], BH99-2 [0 to 1.1 metres (0 to 3.5 feet)], BH99-3 [0 to 1.2 metres (0 to 4 feet)], BH99-4 [0 to 0.9 metres (0 to 3 feet)], BH99-6 [0 to 0.9 metres (0 to 3 feet)], and BH99-7 [0 to 0.9 metres (0 to 3 feet)] were collected from the fill at the west side of the property. In each of these samples, the concentration of a number of metals exceeded the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values (for metals where Cleanup Objectives have not been established), including selenium, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, and zinc.

The concentrations of copper, lead, and zinc were significantly higher than the Cleanup Objectives or Eastern USA/New York State Background Values. The copper concentrations in the fill from BH99-2, BH99-4, and BH99-7 were 13,000 ppm, 20,000 ppm, and 10,000 ppm, respectively, compared to the TAGM 40464 Cleanup Objective of 25 ppm. The concentrations of copper in BH99-1 (940 ppm), BH99-3 (740 ppm), and BH99-6 (480 ppm) were much lower, but were still significantly higher than the Cleanup Objective. Similar concentration were detected for zinc. The lead concentrations in the fill from BH99-2 (11,000 ppm), BH99-4 (20,000 ppm), and BH99-7 (8,400 ppm) significantly exceeded the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046). The concentrations of lead in BH99-1 (740 ppm) and BH99-3 (880 ppm) were much lower, but slightly exceeded the TAGM 4046 typical range found in metropolitan areas. Only one of the fill samples from the west side of the site, BH99-6 (210 ppm), was below the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046). The elevated concentrations of these metals in the fill at the west side of the site did not show a decreasing pattern with distance towards the west. Rather, the samples with the higher concentrations were scattered throughout this area. This may be a result of random historical placement or grading of metal wastes. The lead concentrations in the fill material are shown on Figure 1 to help visualize the extent of metals impacts.

TABLE 4
METALS ANALYTICAL RESULTS IN SOIL – FILL SAMPLES

PARAMETER (ppm)	MDL	BH99-1 (0-3)	BH99-1 (0-3) dup.	BH99-2 (0-3.5)	BH99-3 (0-4)	BH99-4 (0-3)	BH99-6 (0-3)	BH99-7 (0-3)	NYSDEC-TAGM 4046	
Depth (m)	-	0-0.9	0-0.9	0-1.1	0-1.2	0-0.9	0-0.9	0-0.9	Cleanup Objectives	Eastern USA Background
Lab ID Number	-	017229 99	017229 99	017255 99	017230 99	017231 99	017232 99	017233 99		
Sampling Date	-	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09		
Arsenic	0.5	3.9	3.7	12	<2.5	3.9	<2.5	6.9	7.5 or SB	3-12*
Mercury	0.04	**0.16**	**0.18**	**0.32**	**0.37**	**4.5**	**0.26**	**7.1**	0.1	0.001-0.2
Selenium	0.5	<2.5	<2.5	<5.0	<2.5	<2.5	<2.5	<2.5	2 or SB	0.1-3.9
Aluminum	3	10,000	10,000	12,000	9,500	8,900	9,500	8,800	SB	33,000
Barium	0.1	130	130	150	**130**	110	130	**1,000**	300 or SB	15-600
Beryllium	0.1	<1	<1	<	<1	1.1	<1	<1	0.16 or SB	0-1.75
Cadmium	0.2	<2	<2	**12**	<2	**3.0**	<2	**7.2**	1 or SB	0.1-1
Calcium	20	**79,000**	**79,000**	**72,000**	**120,000**	**65,000**	**120,000**	22,000	SB	130-35,000*
Chromium	0.4	**440**	**440**	**940**	**70**	**49**	**75**	**57.**	10 or SB	1.5-40*
Cobalt	1	<10	<10	8	<10	<10	<10	<10	30 or SB	2.5-60*
Copper	0.6	**940**	**950**	**13,000**	**740**	**20,000**	**480**	**10,000**	25 or SB	1-50
Iron	1	**33,000**	**33,000**	**42,000**	**22,000**	**25,000**	**18,000**	**77,000**	2,000 or SB	2,000-550,000
Lead	2	**740**	**750**	**11,000**	**880**	**20,000**	210	**8,400**	SB**	**
Magnesium	5	**21,000**	**21,000**	**32,000**	**12,000**	**10,000**	**13,000**	4,300	SB	100-5,000
Manganese	0.5	**5,500**	**5,600**	**8,500**	570	570	970	740	SB	50-5,000
Molybdenum	1	26	28	37	<10	<10	<10	<10	NV	NV
Nickel	1	**41**	**44**	**150**	**43**	**250**	**37**	110	13 or SB	0.5-25
Phosphorus	6	1,200	1,200	1,000	410	520	940	1,200	NV	NV
Potassium	100	1,100	1,300	1,200	<1,000	1,400	1,000	<1,000	SB	8500-43,000*
Silver	1	<10	<10	4.4	<10	<10	<10	<10	SB	NV
Sodium	10	710	710	470	350	260	220	340	SB	6,000-8,000
Thallium	6	<60	<60	8	<60	<60	<60	<60	SB	NV
Vanadium	0.5	50	49	63	22	16	26	35	150 or SB	1-300
Zinc	0.5	**980**	**990**	**9,900**	**1,100**	**4,800**	**870**	**9,700**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756
mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value

** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm

TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives

TABLE 4
METALS ANALYTICAL RESULTS IN SOIL – FILL SAMPLES (cont'd)

PARAMETER (ppm)	MDL	BW1	BH99-8 (0-4)	BH99-9 (0-4)	BW2 (0-4)	BH99-10 (0-3)	BH99-13 (0-2)	BH99-14 (0-2)	NYSDEC-TAGM 4046	
Depth (m)	–	0-0.9	0-1.2	0-1.2	0-1.2	0-0.9	0-0.6	0-0.6	Cleanup Objectives	Eastern USA Background
Lab ID Number	–	017245 99	017234 99	017235 99	017246 99	017236 99	017237 99	017238 99		
Sampling Date	–	99/04/09	99/04/09	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10		
Arsenic	0.5	**12**	6.7	2.5	2.9	4.7	3.4	2.2	7.5 or SB	3-12*
Mercury	0.04	**9.9**	**1.9**	**1.7**	**2.3**	**3.3**	**0.52**	0.1	0.1	0.001-0.2
Selenium	0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	2 or SB	0.1-3.9
Aluminum	3	9,300	5,800	8,100	7,700	8,000	8,400	2,400	SB	33,000
Barium	0.1	**1,200**	**410**	150	130	280	62	24	300 or SB	15-600
Beryllium	0.1	1	<1	<1	<1	<1	<1	<1	0.16 or SB	0-1.75
Cadmium	0.2	**9.5**	**18**	**11**	**9.7**	**10**	<2	<2	1 or SB	0.1-1
Calcium	20	21,000	26,000	8,400	6,900	30,000	34,000	**230,000**	SB	130-35,000*
Chromium	0.4	**78**	**21**	**19**	**27**	**50**	**15**	**20**	10 or SB	1.5-40*
Cobalt	1	<10	10	14	16	13	<10	<10	30 or SB	2.5-60*
Copper	0.6	**12,000**	**19,000**	**27,000**	**39,000**	**20,000**	**31,000**	**2,700**	25 or SB	1-50
Iron	1	**94,000**	**54,000**	**22,000**	**20,000**	**58,000**	**21,000**	**9,200**	2,000 or SB	2,000-550,000
Lead	2	**9,800**	**7,700**	**31,000**	**46,000**	**18,000**	**25,000**	**4,900**	SB**	**
Magnesium	5	4,600	4,100	3,000	2,200	3,800	3,400	**9,700**	SB	100-5,000
Manganese	0.5	780	810	1,700	1,400	890	150	190	SB	50-5,000
Molybdenum	1	12	<10	21	22	15	11	<10	NV	NV
Nickel	1	**120**	**120**	**560**	**860**	**270**	**140**	**40**	13 or SB	0.5-25
Phosphorus	6	1,400	1,000	1,300	1,300	1,100	340	230	NV	NV
Potassium	100	<1,000	1,100	<1,000	<1,000	<1,000	<1,000	<1,000	SB	8500-43,000*
Silver	1	<10	<10	<10	12	17	13	<10	SB	NV
Sodium	10	360	460	1,200	740	490	170	360	SB	6,000-8,000
Thallium	6	<60	<60	<60	<60	<60	64	<60	SB	NV
Vanadium	0.5	45	17	15	15	27	12	<5	150 or SB	1-300
Zinc	0.5	**12,000**	**21,000**	**43,000**	**55,000**	**19,000**	**14,000**	**1,700**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#1075
** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives.

mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value

TABLE 4
METALS ANALYTICAL RESULTS IN SOIL – FILL SAMPLES (cont'd)

PARAMETER (ppm)	MDL	BH99-15 (0-4)	BH99-15 (0-4) dup.	BH99-17 (0-4)	BH99-18 (0-4)	BH99-19 (0-4)	BH99-20 (0-3)	BH99-21 (0-2.5)	NYSDEC-TAGM 4046	
Depth (m)	–	0-1.2	0-1.2	0-1.2	0-1.2	0-1.2	0-0.9	0-0.8	Cleanup Objectives	Eastern USA Background
Lab ID Number	–	017239 99	017239 99	017240 99	017241 99	017242 99	017243 99	017244 99		
Sampling Date	–	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10		
Arsenic	0.5	**12**	–	**13**	**13**	**16**	**8.6**	**10**	7.5 or SB	3-12*
Mercury	0.04	**1.5**	**1.5**	**0.91**	**1.4**	**0.6**	**0.29**	**1.4**	0.1	0.001-0.2
Selenium	0.5	**2.6**	–	<2.5	**3.4**	<2.5	<2.5	<2.5	2 or SB	0.1-3.9
Aluminum	3	9,300	–	5,400	4,600	6,700	7,600	3,400	SB	33,000
Barium	0.1	220	–	110	97	170	130	66	300 or SB	15-600
Beryllium	0.1	**1.4**	–	<1	<1	**1.1**	<1	<1	0.16 or SB	0-1.75
Cadmium	0.2	**7.3**	–	**3.7**	**6**	**20**	**19**	**3.4**	1 or SB	0.1-1
Calcium	20	26,000	–	17,000	17,000	5,300	18,000	**130,000**	SB	130-35,000*
Chromium	0.4	**33**	–	**16**	**26**	**11**	**13**	**17**	10 or SB	1.5-40*
Cobalt	1	<10	–	<10	<10	<10	<10	<10	30 or SB	2.5-60*
Copper	0.6	**24,000**	–	**11,000**	**2,600**	**60,000**	**38,000**	**7,500**	25 or SB	1-50
Iron	1	**39,000**	–	**20,000**	**32,000**	**40,000**	**25,000**	**19,000**	2,000 or SB	2,000-550,000
Lead	2	**13,000**	–	**7,700**	**1,900**	**19,000**	**22,000**	**6,000**	SB**	**
Magnesium	5	4,500	–	**5,400**	4,200	1,400	2,800	**6,300**	SB	100-5,000
Manganese	0.5	1,000	–	160	920	3,100	2,100	400	SB	50-5,000
Molybdenum	1	12	–	<10	<10	20	14	<10	NV	NV
Nickel	1	**57**	–	**39**	**34**	**84**	**160**	**51**	13 or SB	0.5-25
Phosphorus	6	1,100	–	740	440	1,900	1,500	540	NV	NV
Potassium	100	<1,000	–	<1,000	<1,000	<1,000	<1,000	<1,000	SB	8500-43,000*
Silver	1	<10	–	<10	<10	21	<10	<10	SB	NV
Sodium	10	170	–	120	130	170	300	250	SB	6,000-8,000
Thallium	6	<60	–	<60	<60	<60	67	<60	SB	NV
Vanadium	0.5	21	–	17	17	23	22	17	150 or SB	1-300
Zinc	0.5	**12,000**	–	**3,800**	**1,800**	**29,000**	**30,000**	**3,400**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#1075
** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives.

mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value

TABLE 5
METALS ANALYTICAL RESULTS IN SOIL - NATIVE SILTY CLAY SAMPLES

PARAMETER (ppm)	MDL	BH99-1 (4-6)	BH99-1 (4-6) dup.	BH99-3 (4-6)	BH99-4 (3-4)	BH99-7 (3-4)	BH99-8 (5-8)	BH99-9 (7-8)	BH99-11 (4-6)	NYSDEC-TAGM 4046	
Depth (m)	-	1.2-1.8	1.2-1.8	1.2-1.8	0.9-1.2	0.9-1.2	1.5-2.4	2.1-2.4	1.2-1.8	Cleanup Objectives	Eastern USA Background
Lab ID Number	-	017254 99	017254 99	017257 99	017258 99	017262 99	017263 99	017264 99	017266 99		
Sampling Date	-	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09		
Arsenic	0.5	5.3	5.0	<5.0	<5.0	<5.0	<5.0	**18**	5.3	7.5 or SB	3-12*
Mercury	0.04	<	<	<	<	<	<	<	<	0.1	0.001-0.2
Selenium	0.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2 or SB	0.1-3.9
Aluminum	3	13,000	14,000	15,000	16,000	21,000	16,000	18,000	19,000	SB	33,000
Barium	0.1	100	100	110	120	200	110	130	170	300 or SB	15-600
Beryllium	0.1	**0.7**	**0.7**	**0.7**	**0.8**	**1.0**	**0.8**	**1.0**	**1.1**	0.16 or SB	0-1.75
Cadmium	0.2	0.3	<	0.5	0.2	0.3	0.6	0.4	0.7	1 or SB	0.1-1
Calcium	20	**81,000**	**82,000**	**73,000**	**58,000**	4,400	**77,000**	33,000	2,200	SB	130-35,000*
Chromium	0.4	**20**	**22**	**22**	**22**	**26**	**22**	**23**	**25**	10 or SB	1.5-40*
Cobalt	1	11	12	12	12	11	10	15	20	30 or SB	2.5-60*
Copper	0.6	24	24	24	**55**	**30**	**39**	**65**	**55**	25 or SB	1-50
Iron	1	**23,000**	**24,000**	**25,000**	**26,000**	**31,000**	**25,000**	**47,000**	**41,000**	2,000 or SB	2,000-550,000
Lead	2	14	14	13	26	28	16	32	27	SB**	**
Magnesium	5	**25,000**	**25,000**	**22,000**	**24,000**	**7,600**	**25,000**	**18,000**	**6,000**	SB	100-5,000
Manganese	0.5	570	590	610	630	370	550	610	1,200	SB	50-5,000
Molybdenum	1	1.0	<	<	<	1.0	<	3.0	2.0	NV	NV
Nickel	1	**36**	**37**	**38**	**37**	**34**	**36**	**41**	**45**	13 or SB	0.5-25
Phosphorus	6	610	630	600	650	580	660	660	550	NV	NV
Potassium	100	2,100	2,200	2,600	2,300	2,300	2,300	1,900	2,100	SB	8500-43,000*
Silver	1	<	<	<	<	<	<	<	<	SB	NV
Sodium	10	270	280	140	150	79	180	120	83	SB	6,000-8,000
Thallium	6	<	<	7.0	<	<	<	7.0	7.0	SB	NV
Vanadium	0.5	25	26	26	27	30	27	39	34	150 or SB	1-300
Zinc	0.5	**65**	**66**	**67**	**81**	**95**	**80**	**120**	**110**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756
mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value
** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives

TABLE 5
METALS ANALYTICAL RESULTS IN SOIL – NATIVE SILTY CLAY SAMPLES (cont'd)

PARAMETER (ppm)	MDL	BH99-15 (4-7)	BH99-17 (4-6)	BH99-18 (4-6)	BH99-19 (4-8)	BH99-19 (4-8) dup.	BH99-20 (3-4)	BH99-21 (2.5-4)	NYSDEC-TAGM 4046	
Depth (m)	–	1.2-2.1	1.2-1.8	1.2-1.8	1.2-2.4	1.2-2.4	0.9-1.2	0.8-1.2	Cleanup Objectives	Eastern USA Background
Lab ID Number	–	017269 99	017272 99	017273 99	017274 99	017274 99	017275 99	017276 99		
Sampling Date	–	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09		
Arsenic	0.5	**8.8**	<5.0	**9.8**	6.0	–	6.0	<5.0	7.5 or SB	3-12*
Mercury	0.04	**1.8**	<	<	<	<	0.1	<	0.1	0.001-0.2
Selenium	0.5	<5.0	<5.0	<5.0	<5.0	–	<5.0	<5.0	2 or SB	0.1-3.9
Aluminum	3	4,800	14,000	16,000	15,000	–	14,000	17,000	SB	33,000
Barium	0.1	170	100	120	120	–	94	130	300 or SB	15-600
Beryllium	0.1	**0.4**	**0.6**	**0.8**	**0.7**	–	**0.7**	**0.9**	0.16 or SB	0-1.75
Cadmium	0.2	**8.6**	0.4	0.5	0.2	–	**3.6**	<	1 or SB	0.1-1
Calcium	20	**54,000**	**75,000**	17,000	**68,000**	–	9,100	3,900	SB	130-35,000*
Chromium	0.4	**27**	**20**	**21**	**22**	–	**16**	**23**	10 or SB	1.5-40*
Cobalt	1	7.0	10	13	12	–	8.0	10	30 or SB	2.5-60*
Copper	0.6	**15,000**	**28**	**29**	**76**	–	**220**	**31**	25 or SB	1-50
Iron	1	**33,000**	**23,000**	**36,000**	**25,000**	–	**22,000**	**26,000**	2,000 or SB	2,000-550,000
Lead	2	**6,500**	19	15	23	–	110	16	SB**	**
Magnesium	5	4,500	**24,000**	**15,000**	**22,000**	–	**6,100**	**5,900**	SB	100-5,000
Manganese	0.5	570	540	1,600	560	–	440	300	SB	50-5,000
Molybdenum	1	5.0	<	<	<	–	2.0	1.0	NV	NV
Nickel	1	**75**	**35**	**38**	**39**	–	**19**	**29**	13 or SB	0.5-25
Phosphorus	6	590	660	680	610	–	600	470	NV	NV
Potassium	100	680	2,300	2,100	2,400	–	1,700	1,600	SB	8500-43,000*
Silver	1	4.3	<	<	<	–	<	<	SB	NV
Sodium	10	180	170	95	150	–	180	130	SB	6,000-8,000
Thallium	6	<	9.0	<	<	–	<	<	SB	NV
Vanadium	0.5	15	24	28	26	–	28	31	150 or SB	1-300
Zinc	0.5	**7,000**	**66**	**74**	**87**	–	**2,000**	**87**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#1075
mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value
** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives.

TABLE 6
METALS ANALYTICAL RESULTS IN SOIL – SURFACE GRAB SAMPLES

PARAMETER (ppm)	MDL	SURF 1	SURF 2	SURF 3	SURF 4	BW3	SURF 5	SURF 6	NYSDEC-TAGM 4046	
Depth (m)	–	0.05	0.05	0.05	0.05	0.05	0.05	0.05	Cleanup Objectives	Eastern USA Background
Lab ID Number	–	018219 99	018220 99	018221 99	018222 99	018231 99	018223 99	018224 99		
Sampling Date	–	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14		
Aluminum	3	3,100	2,300	7,600	9,300	9,700	9,100	8,500	SB	33,000
Barium	0.1	32	28	110	110	130	110	110	300 or SB	15-600
Beryllium	0.1	0.2	0.2	0.6	0.5	0.6	0.5	0.5	0.16 or SB	0-1.75
Cadmium	0.2	2.8	2.6	5.7	5.6	6.4	4.5	3.7	1 or SB	0.1-1
Calcium	20	180,000	190,000	38,000	22,000	26,000	59,000	71,000	SB	130-35,000*
Chromium	0.4	20	24	22	20	22	22	20	10 or SB	1.5-40*
Cobalt	1	3.0	2.0	10	11	11	9.0	8.0	30 or SB	2.5-60*
Copper	0.6	3,600	1,300	11,000	10,000	12,000	7,800	5,200	25 or SB	1-50
Iron	1	10,000	11,000	22,000	24,000	25,000	22,000	21,000	2,000 or SB	2,000-550,000
Lead	2	5,400	1,800	11,000	10,000	12,000	7,100	4,900	SB**	**
Magnesium	5	11,000	10,000	7,600	6,300	6,500	13,000	18,000	SB	100-5,000
Manganese	0.5	280	230	620	610	670	540	540	SB	50-5,000
Molybdenum	1	2.0	2.0	8.0	8.0	9.0	6.0	4.0	NV	NV
Nickel	1	54	51	160	180	200	140	110	13 or SB	0.5-25
Phosphorus	6	280	260	1,000	970	1,000	890	700	NV	NV
Potassium	100	400	350	930	900	980	1,100	1,300	SB	8500-43,000*
Silver	1	1.5	<	2.4	1.7	2.3	1.3	<	SB	NV
Sodium	10	200	170	720	560	580	370	460	SB	6,000-8,000
Thallium	6	<	<	<	<	6.0	<	10	SB	NV
Vanadium	0.5	6.8	5.7	16	18	19	18	17	150 or SB	1-300
Zinc	0.5	2,900	1,900	16,000	15,000	17,000	11,000	8,200	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation
Bold values indicate exceedance of Recommended Soil Cleanup Objectives
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756
** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives

mg/kg ppm
MDL Method Detection Limit
* New York State Background
NV No Value

TABLE 6
METALS ANALYTICAL RESULTS IN SOIL – SURFACE GRAB SAMPLES (cont'd)

PARAMETER (ppm)	MDL	SURF 7	SURF 8	SURF 9	SURF 10	SURF 11	SURF 12	NYSDEC-TAGM 4046	
								Cleanup Objectives	Eastern USA Background
Depth (m)	–	0.05							
Lab ID Number	–	018225 99	018226 99	018227 99	018228 99	018229 99	018230 99		
Sampling Date	–	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14		
Aluminum	3	8,100	8,200	10,000	7,400	7,100	4,600	SB	33,000
Barium	0.1	**340**	240	120	75	75	54	300 or SB	15-600
Beryllium	0.1	**0.6**	**0.5**	**0.5**	**0.4**	**0.4**	**0.2**	0.16 or SB	0-1.75
Cadmium	0.2	**10**	**5.4**	**1.4**	**1.2**	**3.2**	**2.0**	1 or SB	0.1-1
Calcium	20	**62,000**	**46,000**	**60,000**	**75,000**	**78,000**	**100,000**	SB	130-35,000*
Chromium	0.4	**37**	**38**	**37**	**52**	**100**	**99**	10 or SB	1.5-40*
Cobalt	1	8.0	7.0	6.0	6.0	6.0	4.0	30 or SB	2.5-60*
Copper	0.6	**8,200**	**3,200**	**360**	**430**	**250**	**240**	25 or SB	1-50
Iron	1	**34,000**	**29,000**	**18,000**	**18,000**	**19,000**	**17,000**	2,000 or SB	2,000-550,000
Lead	2	**5,300**	**2,600**	330	440	290	280	SB**	**
Magnesium	5	**7,800**	**9,700**	**11,000**	**16,000**	**15,000**	**20,000**	SB	100-5,000
Manganese	0.5	710	550	660	710	1,000	1,200	SB	50-5,000
Molybdenum	1	7.0	3.0	1.0	2.0	7.0	4.0	NV	NV
Nickel	1	**97**	**53**	**30**	**30**	**31**	**31**	13 or SB	0.5-25
Phosphorus	6	890	670	510	460	510	340	NV	NV
Potassium	100	910	920	1,400	1,200	1,000	620	SB	8500-43,000*
Silver	1	2.2	<	<	<	<	<	SB	NV
Sodium	10	490	160	240	290	240	510	SB	6,000-8,000
Thallium	6	<	6.0	<	<	<	7.0	SB	NV
Vanadium	0.5	18	20	20	17	20	16	150 or SB	1-300
Zinc	0.5	**9,800**	**4,300**	**550**	**620**	**460**	**400**	20 or SB	9-50

NOTES:

NYSDEC New York State Department of Environmental Conservation

Bold values indicate exceedance of Recommended Soil Cleanup Objectives

Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#1075

** Background levels for lead vary widely. Undeveloped, rural areas may range from 4-61 ppm, Metropolitan or suburban areas or near highways may range from 200-500 ppm

TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994, Recommended Soil Cleanup Objectives.

mg/kg ppm

MDL Method Detection Limit

* New York State Background

NV No Value

TABLE 7
TCLP METALS ANALYTICAL RESULTS IN SOIL (FILL)

PARAMETER (mg/L)	MDL	BH99-1 (0-3)	BH99-1 (0-3) dup.	BH99-3 (0-4)	BH99-6 (0-3)	BH99-7 (0-3)	BH99-8 (0-4)	NYSDEC Regulatory Level
Depth (m)	–	0-0.9	0-0.9	0-1.2	0-0.9	0-0.9	0-1.2	
Lab ID Number	–	019211 99	019211 99	019213 99	019215 99	019217 99	019219 99	
Sampling Date	–	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09	
Arsenic	0.02	<0.022	–	0.027	0.023	0.028	<0.022	5.0
Barium	0.001	0.32	–	0.23	0.33	1.0	0.81	100
Cadmium	0.002	0.005	–	<	<	0.083	0.21	1.0
Chromium	0.004	0.15	–	0.038	0.036	0.016	0.018	5.0
Lead	0.02	<0.022	–	<0.022	<0.022	**17**	**21**	5.0
Mercury	0.00005	<	<	<	<	0.07	<	0.2
Selenium	0.06	<0.066	–	<0.066	<0.066	<0.066	<0.066	1.0
Silver	0.01	<0.011	–	<0.011	<0.011	<0.011	<0.011	5.0
Bulk Lead Concentrations	2	740	740	880	210	8,400	7,700	N/A
		0-2.7'	0-2.7'	0-3.6'	0-2.7'	0-2.7'	0-3.6'	

Total Lead

NOTES: See page 5-17 also.

NYSDEC New York State Department of Environmental Conservation, Regulatory Level Hazardous waste level identified in 6 NYCRR Part 371, Section 371.3

MDL Method Detection Limit

Bold values indicate exceedance of NYSDEC Regulatory Level (i.e. Hazardous Waste)

Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#1075

	TCLP	
BH 9	21 mg/l	Pg. 5-17
BH 10	89 "	"
BH 14	25 "	"
BH 21	7 "	Pg. 5-18

TCLP

TABLE 8
PAH ANALYTICAL RESULTS IN SOIL – FILL SAMPLES

PARAMETER (ppm)	MDL	BH99-10 (0-3)	BH99-10 (0-3) dup.	BH99-15 (0-4)	BH99-17 (0-4)	BH99-18 (0-4)	BH99-19 (0-4)	NYSDEC	
								TAGM 4046	STARS1
Depth (m)	–	0-0.9	0-0.9	0-1.2	0-1.2	0-1.2	0-1.2		
Lab ID Number	–	017236 99	017236 99	017239 99	017240 99	017241 99	017242 99		
Sampling Date	–	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10	99/04/10		
Naphthalene	0.03	**0.37**	**0.4**	**4.2**	**4.6**	**3.8**	**0.58**	13	0.2
Acenaphthylene	0.04	<0.08	<0.08	<0.2	<0.2	<0.4	<	41	NV
Acenaphthene	0.07	<0.14	0.11	**3.4**	**4.0**	<0.7	0.3	50	0.4
Fluorene	0.03	0.17	0.21	**6.9**	**5.8**	<0.3	0.36	50	1
Phenanthrene	0.03	**1.3**	**1.4**	**15**	**18**	**4.6**	**1.7**	50	1
Anthracene	0.03	**0.1**	0.11	**1.8**	**2.8**	**2.3**	0.28	50	1
Fluoranthene	0.02	0.79	0.93	**8.3**	**20**	**7.6**	0.39	50	1
Pyrene	0.03	0.76	0.86	12	18	12	0.88	**50**	1
Benzo(a)anthracene	0.02	**0.42**	**0.48**	**3.3**	7.2	**4.2**	**0.17**	0.224 or MDL	0.00004
Chrysene	0.03	**0.53**	**0.65**	**4.7**	**8.9**	**5**	**0.24**	0.4	0.00004
Benzo(b)fluoranthene	0.04	**0.61**	**0.72**	**4.1**	7.3	**4.7**	**0.18**	1.1	0.00004
Benzo(k)fluoranthene	0.04	**0.44**	**0.29**	**3.6**	4.4	**2.4**	**0.11**	1.1	0.00004
Benzo(a)pyrene	0.05	**0.53**	**0.53**	**3.2**	**6.0**	**3.7**	**0.15**	0.061 or MDL	0.00004
Indeno(1,2,3-cd)pyrene	0.06	**0.54**	**0.59**	**3.2**	**5.2**	**4**	**0.16**	3.2	0.00004
Dibenzo(ah)anthracene	0.04	0.23	0.2	**1.2**	1.5	1.5	<	0.014 or MDL	1
Benzo(ghi)perylene	0.04	**0.54**	**0.59**	**2.6**	**4.4**	**3.4**	**0.17**	50	0.00004

NOTES:

mg/kg ppm
MDL Method Detection Limit
BOLD values indicate exceedance of applicable guidance or cleanup objective value
Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756
NYSDEC New York State Department of Environmental Conservation
TAGM 4046 NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994
STARS1 NYSDEC's Spill Technology and Remediation Series Memo #1 "Petroleum-Contaminated Soil Guidance Policy" August 1992 Table 2 TCLP Alternative Guidance Values
Data compared to STARS1 first. If no guidance value, compare to TAGM 4046

PAH

TABLE 9
VOC ANALYTICAL RESULTS IN SOIL - FILL SAMPLES

PARAMETER (ppm)	MDL	BH99-10 (0-3)	BH99-15 (0-4)	BH99-17 (0-4)	BH99-18 (0-4)	BH99-19 (0-4)	NYSDEC	
							TAGM 4046	STARS1
Depth (m)	-	0-0.9	0-1.2	0-1.2	0-1.2	0-1.2		
Lab ID Number	-	017236 99	017236 99	017240 99	017241 99	017242 99		
Sampling Date	-	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09		
Acetone	0.065	1.7	<1.3	<1.3	<1.3	<1.3	0.2	NV
Acrolein	0.010	<0.2	<0.2	<0.2	<0.2	<0.2	NV	NV
Acrylonitrile	0.013	<0.26	<0.26	<0.26	<0.26	<0.26	NV	NV
Benzene	0.001	0.018	0.03	0.029	<0.02	0.026	0.06	0.014
Bromoform	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	NV	NV
Bromomethane	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	NV	NV
2-Butanone	0.012	<0.24	<0.24	<0.24	<0.24	<0.24	0.3	NV
Carbon Disulphide	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	2.7	NV
Carbon Tetrachloride	0.006	<0.12	<0.12	<0.12	<0.12	<0.12	0.6	NV
Chlorobenzene	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	1.7	NV
Chlorodibromomethane	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	NV	NV
Chloroethane	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	1.9	NV
2-Chloroethylvinylether	0.013	<0.26	<0.26	<0.26	<0.26	<0.26	NV	NV
Chloroform	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	0.3	NV
Chloromethane	0.005	<0.1	<0.1	<0.1	<0.1	<0.1	NV	NV
1,2-Dichlorobenzene	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	7.9	NV
1,3-Dichlorobenzene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	1.6	NV
1,4-Dichlorobenzene	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	8.5	NV
Dichlorobromomethane	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	NV	NV
1,1-Dichloroethane	0.006	<0.12	<0.12	<0.12	<0.12	<0.12	0.2	NV
1,2-Dichloroethane	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	0.1	NV
1,1-Dichloroethene	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	0.4	NV
Methyl-t-butylether	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	NV	NV
Ethylene Dibromide	0.007	<0.14	<0.14	<0.14	<0.14	<0.14	NV	NV
1,2-Dibromo-3-Chloropropane	0.050	<1	<1	<1	<1	<1	NV	NV
cis-1,2-Dichloroethene	0.003	<0.06	0.7	<0.06	<0.06	<0.06	NV	NV
trans-1,2-Dichloroethene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	0.3	NV
1,2-Dichloropropane	0.007	<0.14	<0.14	<0.14	<0.14	<0.14	NV	NV

TABLE 9
VOC ANALYTICAL RESULTS IN SOIL – FILL SAMPLES (cont'd)

PARAMETER (ppm)	MDL	BH99-10 (0-3)	BH99-15 (0-4)	BH99-17 (0-4)	BH99-18 (0-4)	BH99-19 (0-4)	NYSDEC	
Depth (m)	–	0-0.9	0-1.2	0-1.2	0-1.2	0-1.2	TAGM 4046	STARS1
Lab ID Number	–	017236 99	017236 99	017240 99	017241 99	017242 99		
Sampling Date	–	99/04/09	99/04/09	99/04/09	99/04/09	99/04/09		
cis-1,3-Dichloropropene	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	NV	NV
trans-1,3-Dichloropropene	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	NV	NV
Ethylbenzene	0.002	<0.04	0.096	0.11	<0.04	<0.04	5.5	0.1
2-Hexanone	0.008	<0.16	<0.16	<0.16	<0.16	<0.16	NV	NV
Methylene Chloride	0.010	0.47	0.49	0.45	0.53	0.71	0.1	NV
4-Methyl-2-Pentanone	0.009	<0.18	<0.18	<0.18	<0.18	<0.18	1.0	NV
Styrene	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	NV	NV
1,1,1,2-Tetrachloroethane	0.002	<0.04	<0.04	<0.04	<0.04	<0.04	NV	NV
1,1,2,2,-Tetrachloroethane	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	0.6	NV
Tetrachloroethene	0.003	<0.06	0.24	<0.06	<0.06	<0.06	1.4	NV
Toluene	0.002	0.04	0.12	0.15	0.062	0.073	1.5	0.1
1,1,1-Trichloroethane	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	0.8	NV
1,1,2-Trichloroethane	0.004	<0.08	<0.08	<0.08	<0.08	<0.08	NV	NV
Trichloroethene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	0.7	NV
Vinyl Acetate	0.009	<0.18	<0.18	<0.18	<0.18	<0.18	NV	NV
Vinyl Chloride	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	0.2	NV
m&p-Xylene	0.004	<0.08	0.27	0.25	0.18	0.096	NV	0.1
o-Xylene	0.002	<0.04	0.19	0.13	0.11	0.049	NV	0.1
mixed Xylenes	0.006	<0.12	0.46	0.38	0.29	0.145	1.2	0.1
Isopropylbenzene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	NV	0.1
n-Propylbenzene	0.003	<0.06	0.078	0.066	<0.06	<0.06	NV	0.1
p-Isopropyltoluene	0.003	0.067	0.1	0.095	<0.06	<0.06	NV	0.1
1,2,4-Trimethylbenzene	0.003	0.11	0.81	0.39	0.15	0.07	NV	0.1
1,3,5-Trimethylbenzene	0.003	<0.06	0.28	0.45	<0.06	<0.06	NV	0.1
n-Butylbenzene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	NV	0.1
sec-Butylbenzene	0.003	<0.06	0.064	0.066	<0.06	<0.06	NV	0.1
t-butylbenzene	0.003	<0.06	<0.06	<0.06	<0.06	<0.06	NV	0.1

NOTES (for Table 9):

MDL	Method Detection Limit mg/kg ppm
BOLD	values indicate exceedance of applicable guidance or cleanup objective value
Analysis	conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756
NYSDEC	New York State Department of Environmental Conservation
TAGM 4046	NYSDEC Technical and Administrative Guidance Memorandum 4046, "Determination of Soil Cleanup Objectives and Cleanup Levels" revised January 24, 1994
STARS1	NYSDEC's Spill Technology and Remediation Series Memo #1 "Petroleum-Contaminated Soil Guidance Policy" August 1992, Table 2 TCLP Alternative Guidance Values

Data compared to STARS1 first. If no guidance value, compare to TAGM 4046

The fill samples from BH99-1, BH99-3, BH99-6, and BH99-7 were analyzed for TCLP metals to determine the soil waste classification. The results are presented in Table 7. Section 371.3 of 6NYCRR Part 371 states that solid waste is a hazardous waste if it exhibits any of the characteristics identified in that section. One of these characteristics is the leachate toxicity characteristic. The concentration of lead in the leachate extracted from BH99-7 was 17 mg/L (ppm), which exceeds the regulatory level of 5 mg/L (6NYCRR Part 371, Section 371.3). The total lead detected in this fill sample was 8,400 ppm. Therefore, the fill material in the area of BH99-7 is considered to be a hazardous waste. The lead concentrations in leachate from fill samples BH99-1, BH99-3, and BH99-6 were all below 0.022 mg/L. These samples had total lead concentrations of 740 ppm, 880 ppm, and 210 ppm.

Samples of the underlying native silty clay from BH99-1 [1.2 to 1.8 metres (4 to 6 feet)], BH99-3 [1.2 to 1.8 metres (4 to 6 feet)], BH99-4 [0.9 to 1.2 metres (3 to 4 feet)], and BH99-7 [0.9 to 1.2 metres (3 to 4 feet)] were analyzed to determine the vertical extent of metals impacts (see Table 5). Select metals including beryllium, calcium, chromium, copper, iron, magnesium, nickel, and zinc slightly exceeded TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values. The concentrations of copper in BH99-4 (55 ppm) and BH99-7 (30 ppm) marginally exceeded the Cleanup Objective of 25 ppm. The Eastern USA Background Value is 50 ppm (high end). The concentrations of zinc in these four silty clay samples ranged from 65 to 95 ppm, compared to the Cleanup Objective of 20 ppm and Eastern USA Background Value of 50 ppm (high end). Although the concentrations of copper and zinc exceeded the cleanup objectives, the values were more comparable to typical Eastern USA Background Values. The concentrations of lead were much lower than the overlying fill samples and significantly lower than the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046). The lead concentrations in the native silty clay ranged from 13 to 28 ppm.

Trucking Area

The analytical results of soil samples collected from the trucking area were similar to those found at the west side of the property. Fill samples from BH99-8 [0 to 1.2 metres (0 to 4 feet)], BH99-9 [0 to 1.2 metres (0 to 4 feet)], BH99-10 [0 to 0.9 metres (0 to 3 feet)], BH99-13 [0 to 0.6 metres (0 to 2 feet)], and BH99-14 [0 to 0.6 metres (0 to 2 feet)] contained a number of metals which exceeded the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values. The concentrations of copper, lead, and zinc exceeded the TAGM 4046 values in all six fill samples analyzed. The copper concentrations ranged from 2,700 ppm in BH99-14 to 60,000 ppm in BH99-19, compared to the TAGM 4046 Cleanup Objective of 25 ppm. The zinc concentrations ranged from 1,700 ppm in BH99-14 to 55,000 ppm in BW1 (field duplicate of BH99-9). The TAGM 4046 Cleanup Objective for zinc is 20 ppm. The lead concentrations in BH99-8 (7,700 ppm), BH99-9 (31,000 ppm), BH 99-10 (18,000 ppm), BH99-13 (25,000 ppm), BH99-14 (4,900 ppm), and BH99-19 (19,000 ppm) were well above the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046).

As discussed previously, petroleum hydrocarbon odours were detected in the fill at boreholes BH99-10 [0 to 0.9 metres (0 to 3 feet)] and BH99-19 [0 to 1.2 metres (0 to 4 feet)], which are located near the south side of the trucking area. The analytical results of VOCs and PAHs are presented in Tables 8 and 9. The concentrations of benzene and 1,2,4-trimethylbenzene in BH99-10 were 0.018 ppm and 0.11 ppm, respectively. The levels marginally exceed the STARS1 TCLP Alternative Guidance Values of 0.014 ppm and 0.1 ppm, respectively. The concentrations of acetone (1.7 ppm) and methylene chloride (0.47 ppm) slightly exceeded the TAGM 4046 Cleanup Objectives of 0.2 ppm and 0.1 ppm, respectively. The sources of acetone and methylene chloride (dichloromethane) are currently unknown. In both of these fill samples, nine of the PAH parameters exceeded the STARS1 TCLP Alternative Guidance Values.

The fill samples from BH99-8, BH99-10, and BH99-14 were analyzed for TCLP metals to determine the soil waste classification in the trucking area. The concentrations of lead in the leachate were 21 mg/L (total lead was 7,700 ppm), 89 mg/L (total lead was 18,000 ppm), and 25 mg/L (total lead was 4,900 ppm), respectively. These levels exceed the New York State regulatory level of 5 mg/L (6NYCRR Part 371).

Similar to the west side of the site, the analytical results of the underlying native silty clay in the trucking area showed a significant decrease in the metal concentrations. Although a number of metals exceeded the TAGM 4046 Cleanup Objectives, the concentrations in the silty clay were more comparable to typical Eastern USA/New York State Background Values. For instance, the

concentrations of copper ranged between 30 ppm in BH99-7 and 76 ppm in BH99-19, which exceeds the TAGM 4046 Cleanup Objective of 25 ppm. The high end of the range of typical Eastern USA Background Values is 50 ppm. Similar to the west side of the property, the lead concentrations in the silty clay were significantly lower than the fill material, and were well below the typical background range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046). The concentrations of lead ranged from 16 ppm in BH99-8 to 32 ppm in BH99-9.

Rail Siding Area

In the rail siding area, samples of the fill material from BH99-15 [0 to 1.2 metres (0 to 4 feet)], BH99-17 [0 to 1.2 metres (0 to 4 feet)], and BH99-18 [0 to 1.2 metres (0 to 4 feet)] contained concentrations of a number of metals which exceeded the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values. The concentrations of copper ranged from 2,600 ppm at the east end of the rail siding to 24,000 ppm to the west. These values are well above the TAGM 4046 Cleanup Objective of 25 ppm. The concentrations of zinc ranged between 1,800 ppm in BH99-18 to 12,000 ppm in BH99-15, compared to the TAGM Cleanup Objective of 20 ppm. The concentrations of lead in the fill in BH99-15 (13,000 ppm), BH99-17 (7,700 ppm), and BH99-18 (1,900 ppm) were well above the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046).

As mentioned previously, petroleum hydrocarbon odours and an oily sheen were observed in the fill material along the rail siding. Soil samples from BH99-15 [0 to 1.2 metres (0 to 4 feet)], BH99-17 [0 to 1.2 metres (0 to 4 feet)], and BH99-18 [0 to 1.2 metres (0 to 4 feet)] were analyzed for VOCs and PAHs. In BH99-15 and BH99-17, the concentrations of benzene, xylenes, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene exceeded the STARS1 TCLP Alternative Guidance Values. The concentration of toluene in BH99-15 also exceeded the STARS1 TCLP Alternative Guidance Values. In BH99-18, the concentrations of xylenes and 1,2,4-trimethylbenzene were above the Guidance Values. The concentrations of methylene chloride in all three of these fill samples were above the Guidance Values. At least twelve PAH parameters exceeded the TCLP Alternative Guidance Values.

The fill samples from BH99-17 and BH99-18 were analyzed for TCLP metals to determine the waste classification in the rail siding area. The concentration of lead in the leachate from BH99-17 was 100 mg/L (total lead was 7,700 ppm), which exceeds the regulatory level of 5 mg/L. In BH99-18, the lead in leachate concentration was 1.1 mg/L while its total lead concentration was 1,900 ppm.

The analytical results of the underlying silty clay samples along the rail siding were similar to those detected in other areas of the property, except for BH99-15. The concentrations of copper and zinc in BH99-17 and BH99-18 slightly exceeded the TAGM 4046 Cleanup Objectives, but were more comparable to the typical Eastern USA Background Values than the fill results. The lead concentrations in these two silty clay samples were 19 ppm and 15 ppm, respectively, which is well below the typical range of 200 to 500 ppm found in metropolitan areas. The concentration of lead in the silty clay sample from BH99-15 was 6,500 ppm. This was the only sample of the 13 native silty clay samples that exceeded the TAGM 4046 typical metropolitan range. This one exceedance may simply represent contamination at the upper zone of the silty clay unit (i.e. at the fill and silty clay interface).

East Side of Property

The fill samples from BH99-20 [0 to 0.9 metres (0 to 3 feet)] and BH99-21 [0 to 0.8 metres (0 to 2.5 feet)] exceeded the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values for a number of metals. Similar to the fill samples collected from other areas of the site, the fill at the east side of the property contains elevated concentrations of metals. The fill samples in this area were initially planned to be used for site-specific Background Values, considering that this area is used for parking (i.e. not for operational use). However, the concentrations of select metals, including copper, lead, and zinc suggest that metals bearing material has been historically placed in this area. The concentrations of copper in BH99-20 (38,000 ppm) and BH99-21 (7,500 ppm) were well above the TAGM 4046 Cleanup Objective of 25 ppm. The zinc concentrations in these two samples were 30,000 ppm and 3,400 ppm, respectively, compared to the TAGM 4046 Cleanup Objective of 20 ppm. Lead was detected in the fill in BH99-20 at 22,000 ppm and at 6,000 ppm in BH99-21.

One of these fill samples (BH99-21) was analyzed for TCLP metals to determine the waste classification at the east side of the property. The concentration of lead in leachate in this sample was 7.0 mg/L, which slightly exceeds the regulatory level of 5 mg/L. The total lead concentration was detected at 6,000 ppm.

The underlying native silty clay samples from BH99-20 and BH99-21 were analyzed to determine the vertical extent of metals impacts. The concentration of a number of metals exceeded the Cleanup Objectives, but were more comparable to the Eastern USA/New York State Background Values. Lead was detected in these two samples at 110 and 16 ppm, respectively. These concentrations were well below the typical range of 200 to 500 ppm found in metropolitan areas (as identified in TAGM 4046).

North Property Line

As requested by the NYSDEC, XCG collected twelve surface grab samples along the north property line, at a depth of 0 to 0.05 metres (0 to 2 inches). The surface samples were located between the west property line and the garage situated in the trucking area. The focus of these samples was the concentration of lead at the surface of the fill. Samples SURF 1 to SURF 8 were located between the shed and the marsh plant area, and contained lead concentrations ranging between 1,800 ppm and 11,000 ppm. These concentrations exceed the TAGM 4046 typical range of 200 to 500 ppm found in metropolitan areas. Samples SURF 9 to SURF 12 were situated to the west of the marsh plants. The concentrations of lead in these samples were much lower and ranged between 280 ppm and 440 ppm.

5.2.1 Summary of Soil Results

In summary, the analytical data has shown that metals impacted fill exists throughout the property. The findings of the Limited Phase 2 ESA indicated that the fill material in the central portion of the property (i.e. area of former lagoon and marsh) contains concentrations of copper, lead, and zinc that are higher than the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values. TCLP analysis conducted previously by XCG on fill samples from the central portion of the property indicated that leachate concentration of lead exceeded the regulatory limit. The current study, Additional Phase 2 ESA, was conducted to delineate the extent of metals impacts. The results indicate that the fill material at the west side of the property, trucking area, rail siding area, and east side of the site (i.e. paved parking area) contains elevated concentrations of metals including copper, lead, and zinc. TCLP analysis conducted on these samples indicate that a majority of the fill contains concentrations of lead in leachate that exceed the regulatory limit.

Petroleum hydrocarbon odours and an oily sheen were observed in the fill material along the rail siding, which is located at the south side of the property, at the east end. These field observations were also noted in two boreholes located between the rail siding and the former lagoon. The concentrations of a number of VOC and PAH parameters exceeded the STARS1 TCLP Alternative Guidance Values.

Considering that the underlying native soil is a stiff to hard silty clay, the metals impact is not expected to extend significantly downwards. This was substantiated by the analytical results of metals in silty clay soil samples, as the concentrations copper, lead, and zinc were significantly lower than those detected in the fill material. Although copper and zinc slightly exceeded the Cleanup Objectives in the silty clay, the concentrations of these metals were more comparable to typical Eastern USA Background Values than those detected in the fill. The lead

concentrations in 12 of the 13 native silty clay samples analyzed were well below the background range for metropolitan areas, as identified in TAGM 4046.

5.3 Groundwater Results

A total of 4 groundwater samples were submitted to PASC for analyses of metals. One of these samples was a blind field duplicate of MW99-1 (identified as BW4). A summary of the analytical results is presented in Table 10. The TOGS 1.1.1 values developed for groundwater drinking purposes were used for comparison. Copies of the Certificates of Analyses from PASC are included in Appendix B.

The monitoring wells were installed in the native silty clay stratum. The concentrations of iron in the groundwater from MW99-1 and MW99-2 were 390 μg/L (parts per billion, ppb) and 320 μg/L, respectively. These values exceed the TOGS 1.1.1 Aesthetic Standard of 300 μg/L. The concentrations of magnesium in the three monitoring wells ranged between 78,000 μg/L and 130,000 μg/L, which exceeds the TOGS 1.1.1 Guidance Value of 35,000 μg/L. The concentrations of sodium (25,000 to 70,000 μg/L) also exceeded the TOGS 1.1.1 Guidance Value of 20,000 μg/L. Given that the site is located in an urbanized area, the high concentrations of sodium may be attributed to road salting during the winter season. The concentrations of lead in MW99-1 (26 μg/L) and MW99-3 (27 μg/L) marginally exceeded the TOGS 1.1.1 Standard of 25 μg/L. The concentration in MW99-2 was below the laboratory's method detection limit.

5.3.1 Summary of Groundwater Results

There were some exceedances of the TOGS 1.1.1 Standards or Guidance Values for select metals in groundwater, including iron, magnesium, lead, and sodium. However, these values were developed for potable groundwater. The subject site and surrounding area is serviced by a municipal drinking water supply, which draws its water from Lake Erie. The elevated levels of sodium may be related to road salting, given that the subject site is located in an urbanized area.

TABLE 10
METALS ANALYTICAL RESULTS IN GROUNDWATER

PARAMETER (µg/L)	MDL	MW99-1	MW99-1 Dup.	BW4	MW99-2	MW99-3	NYSDEC TOGS 1.1.1	
Lab ID Number	-	018233 99	018233 99	018236 99	018234 99	018235 99	Standards	Guidance Value
Sampling Date	-	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15		
Arsenic	2	<	-	<	<	<	25	NV
Mercury	0.05	<	-	<	<	<	0.7	NV
Selenium	2.0	<	-	<	<	<	10	NV
Aluminum	30	360	390	680	80	34	NV	NV
Barium	1.0	81	83	92	140	54	1,000	NV
Beryllium	1.0	<	<	<	<	<	3	NV
Cadmium	2.0	2	<	<	<	2	5	NV
Calcium	200	72,000	75,000	81,000	130,000	100,000	NV	NV
Chromium	4	<	5	5	<	5	50	NV
Cobalt	10	<	<	<	<	<	NV	NV
Copper	5.0	24	25	49	6	<	200	NV
Iron	10	390	470	970	320	76	300*	NV
Lead	20	26	<	35	<	27	25	NV
Magnesium	50	78,000	80,000	82,000	130,000	52,000	NV	35,000
Manganese	6.0	63	65	77	65	36	300*	NV
Molybdenum	10	<	<	10	<	<	NV	NV
Nickel	10	23	21	20	39	24	100	NV
Phosphorus	60	<	63	66	89	<	NV	NV
Potassium	1,000	2,000	1,800	2,100	8,300	2,600	NV	NV
Silver	10.0	<	<	<	<	<	50	NV
Sodium	100	64,000	66,000	70,000	25,000	26,000	20,000	NV
Thallium	60	<	<	<	<	<	NV	0.5
Vanadium	5.0	<	<	<	<	<	NV	NV
Zinc	5.0	20	25	57	7	<	NV	2,000

NOTES:

MDL Method Detection Limit
µg/L parts per billion (ppb)
NV no standard or guidance value
BOLD values indicate exceedance of standard or guidance value
< indicates less than MDL
MW98-1 dup laboratory duplicate of MW98-1
BW1 blind field duplicate of MW98-2
* aesthetic standard for the sum of iron and manganese is 500 µg/L

Analysis conducted by Philip Analytical Services Corporation, New York State ELAP ID#10756

NYSDEC New York State Department of Environmental Conservation
TOGS 1.1.1 NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1), "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" October 22, 1993 (reissued June 1988)

5.4 QA/QC

Blind field duplicates of soil and groundwater samples were analyzed to determine the laboratory's analytical accuracy. The blind field soil duplicates of BH99-7 [0 to 0.9 metres (0 to 3 feet)], BH99-9 [0 to 1.2 metres (0 to 4 feet)], and SURF 4 were identified as BW1, BW2, and BW3. The analytical results of metals in the duplicates were comparable to the original samples. In addition, PASC conducted laboratory duplicate analysis of BH99-1 [0 to 0.9 metres (0 to 3 feet)], BH99-1 [1.2 to 1.8 metres (4 to 6 feet)], BH99-15 [0 to 1.2 metres (0 to 4 feet)], BH99-19 [1.2 to 2.4 metres (4 to 8 feet)] for metals, and BH99-1 [0 to 0.9 metres (0 to 3 feet)] and BH99-14 [0 to 0.6 metres (0 to 2 feet)] for TCLP metals. A laboratory duplicate analyses of PAHs was also conducted for BH99-10 [0 to 0.9 metres (0 to 3 feet)]. The analytical results of the laboratory duplicates were similar to the concentrations detected in the original samples. A blind groundwater field duplicate from MW99-1 (identified as BW4) was tested for metals. PASC also performed a laboratory duplicate analyses of MW99-1. The analytical results of the duplicates and original sample were generally comparable. Further, the results of PASC's internal QA/QC program (i.e. method blanks, spiked blanks, matrix spikes, and surrogate recoveries) were considered representative.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Limitations

This Additional Phase 2 Environmental Site Assessment focused on identifying any environmental damages as they relate to existing or potential future environmental liabilities relating specifically to the investigated areas of the property located at 3241 Walden Avenue in Depew, New York.

The conclusions drawn from the Additional Phase 2 ESA were based on information at selected observation and sampling locations on April 8, 9, 14, and 15, 1999. In addition, the conclusions were based on the parameters that were chemically analyzed. Conditions between and beyond these locations may become apparent, during future investigations or on-site work, which could not be detected or anticipated at the time of this study. The sample locations were chosen to investigate exterior locations not studied in the Limited Phase 2 ESA, in an effort to delineate the lateral and vertical extent of metals impacts. The testing program was based on limited information provided by persons knowledgeable about the past and current activities on the site. As such, XCG cannot be held responsible for environmental conditions that were not apparent from the available information.

The scope of this report is limited to the matters expressly covered. This report was prepared for the sole benefit of Norampac, Inc. and may not be relied upon by any other person or entity without written authorization of XCG Consultants Ltd. As such, any use or reuse of this document (or the findings, conclusions, or recommendations represented herein), by parties other than Norampac, Inc., is at the sole risk of those parties.

6.2 Conclusions

The overall conclusion from the February 1999 Limited Phase 2 Environmental Site Assessment and the current Additional Phase 2 Environmental Site Assessment is that a majority of the fill material at the subject site contains metals concentrations that exceed the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values and the TCLP results indicate that much of the metals impacted fill exceeds the regulatory limit for lead. In addition, the rail siding, and former lagoon/marsh and south part of the trucking area (which are adjacent to the rail corridor and west of the rail siding) have been impacted by residual petroleum hydrocarbon.

Supporting conclusions are as follows:

1. With respect to field observations:
   - The fill materials on the property consists of varying mixtures of silty sand, sandy silt, sand and gravel, and silty clay. Construction debris is also present in some of the fill. The fill depth generally ranges between 0.6 to 1.8 metres (2 to 6 feet) and is deeper in the former lagoon. The fill is underlain by a native silty clay stratum.
   - No visual or olfactory evidence of petroleum impacts was detected in either the fill material or native silty clay at the west side of the property.
   - Visual and olfactory evidence of petroleum impacts was observed in the fill at the former lagoon and marsh.
   - Some of the fill at the south end of the trucking area contained a mild hydrocarbon odour and an oily sheen. The underlying silty clay in this area did not exhibit any evidence of petroleum impacts.
   - The fill material located along the rail siding had a hydrocarbon odour and an oily sheen. Petroleum impacts were not detected in the underlying silty clay stratum.
   - No visual or olfactory evidence of petroleum impacts was detected in either the fill material or underlying silty clay stratum at the east side of the property.

2. With respect to analytical results:
   - Overall, the analytical results from the current investigation and the previous study, Limited Phase 2 ESA, have provided a clear indication of the extent of petroleum and metal impacts throughout the exterior of the property. The petroleum impacts associated with the former lagoon have been confined within the fill zone of the former lagoon and adjacent marsh. In addition, petroleum impacts exist in the fill zone along the rail siding and at the south end of the trucking area (between the rail siding and former lagoon). Elevated concentrations of metals exist throughout a majority of the property within the fill zone. The underlying very stiff to hard native silty clay is acting as an effective barrier to vertical migration of contaminants.
   - Analytical testing was conducted in the fill material at 17 of the 24 borehole and monitoring well locations. These samples were considered to be worst case and representative of the fill conditions in the areas investigated. Based on the analytical results of the fill

samples, analysis of 13 underlying native silty clay samples was subsequently conducted for metals. In addition, 13 surface grab samples were collected along the north property line for metals analyses. A total of 10 fill samples were analyzed for TCLP metals to determine the waste classification. Five fill samples that contained visual and olfactory evidence of petroleum impacts were analyzed for VOCs and PAHs.

- On-site fill material was not considered appropriate to be used for developing site-specific Background Values. Analytical results indicate that areas originally planned for this use have been impacted by historical operations.

- At the **west side of the site**, the concentrations of copper, lead, and zinc exceeded the Cleanup Objectives or Eastern USA/New York State Background Values. The concentration of lead in one sample (210 ppm) did not exceed the typical range of values found in metropolitan areas identified in TAGM 4046. The remaining samples did exceed the Background Values for lead, and ranged between 740 ppm and 20,000 ppm. Although the concentrations of copper and zinc in the underlying silty clay samples exceeded the Cleanup Objectives, their values were more comparable to the Eastern USA Background Values. The lead concentrations in the silty clay were much lower than the fill, and ranged between 13 and 28 ppm. TCLP analysis on three fill samples (total lead ranging between 210 and 880 ppm) indicated a lead concentration in leachate of less than 5 mg/L (6NYCRR Part 371). The concentration of lead in leachate in a fourth sample (total lead was 8,400 ppm) was 17 mg/L, which exceeds the regulatory level.

- At the **central portion of the property**, analytical results of select metals in the fill material exceeded the TAGM 4046 Cleanup Objectives or Eastern USA/New York State Background Values. TCLP results indicate that concentrations of lead exceed the regulatory level. The concentrations of lead, copper, and zinc in the underlying native silty clay were much lower. Select VOCs and PAHs in the fill of the former lagoon exceeded the STARS1 TCLP Alternative Guidance Values.

- In the **trucking area**, all six fill samples analyzed exceeded the Cleanup Objectives or Eastern USA/New York State Background Values for several metals, including copper, lead, and zinc. The lead concentrations ranged between 4,900 ppm and 31,000 ppm. Similar to the silty clay at the west side of the property, the native soil in the trucking area contained metals that exceeded the Cleanup Objectives, but were much more comparable to the Eastern USA

Background Values. The concentrations of lead in the silty clay ranged from 16 to 32 ppm. TCLP analysis was conducted on three fill samples (total lead concentrations ranged from 4,900 ppm to 18,000 ppm) and the concentrations of lead in leachate ranged between 21 mg/L and 89 mg/L, which exceeds the regulatory level of 5 mg/L. Petroleum hydrocarbon odours were detected in two fill samples near the south end of the trucking area. Select VOCs and PAHs exceeded the STARS 1 TCLP Alternative Guidance Values or TAGM 4046 Cleanup Objectives.

- Along the **rail siding**, the concentrations of copper, lead, and zinc in the fill material were higher than the Cleanup Objectives and Eastern USA/New York State Background Values. The concentrations of lead ranged from 1,900 ppm to 13,000 ppm. The lead concentrations of two silty clay samples were 15 ppm and 19 ppm, which is well below the typical range of 200 to 500 ppm found in metropolitan areas (TAGM 4046). The concentration of lead in a third silty clay sample was 6,500 ppm. This was the only sample of the 13 native silty clay samples that exceeded the typical range of 200 to 500 ppm found in metropolitan areas. This one exceedance may simply represent contamination at the upper zone of the silty clay unit (i.e. at the fill and silty clay interface). The concentrations of lead in leachate of two fill samples were 1.1 mg/L (total lead was 1,900 ppm) and 100 mg/L (total lead was 7,700 ppm). Therefore, a portion of the fill along the rail siding exceeds the regulatory limit. Select VOCs and PAHs exceeded the TCLP Alternative Guidance Values.

- At the **east side of the property (paved parking area)**, the analytical results of metals in the fill material were similar to elsewhere on the property. Concentrations of lead in two samples were 6,000 ppm and 22,000 ppm. The lead concentrations in the underlying native silty clay samples were 16 ppm and 110 ppm, which are well below the typical range of values found in metropolitan areas (as identified in TAGM 4046). The TCLP analysis of one of the fill samples showed a lead in leachate concentration of 7.0 mg/L, which slightly exceeds the regulatory limit of 5.0 mg/L.

- Along the **north property line**, surface grab samples were collected at twelve locations for metals analysis. The eight samples located between the garage in the trucking area and the marsh plant area contained lead concentrations ranging from 1,800 ppm to 11,000 ppm. The concentrations of lead in the four surface samples

situated between the marsh plant area and the west property line ranged from 280 ppm to 440 ppm.

- Groundwater samples from the three newly installed monitoring wells were analyzed for metals. Select metals exceeded the TOGS 1.1.1 Standards or Guidance Values, including iron, magnesium, and sodium. The concentrations of lead in MW99-1 (26 μg/L) and MW99-3 (27 μg/L) marginally exceeded the TOGS 1.1.1 Standard of 25 μg/L. The elevated levels of sodium may be attributed to road salting.

6.3 Recommendations

The findings indicate that on-site locations are not appropriate for use as site-specific Background Values. In the absence of this data, the TAGM 4046 Cleanup Objectives and typical Background Values were used for assessment. Given that the subject property is located in an industrial area and is adjacent to a rail corridor, local Background Values may be higher than the TAGM 4046 Cleanup Objectives. In order to develop a remedial action plan, Norampac and the NYSDEC should agree to establish a set of Cleanup Objectives applicable to the subject site. Background Values used by the NYSDEC for other projects with similar industrial settings could be considered.

APPENDIX A

BOREHOLE LOGS

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Well MW99-1

Driller: Maxim Technologies Inc.

Borehole Diameter: 19 cm

Drill Method: Truck-Mounted Acker Soilmax Hollow Stem

Start Date: April 8, 1999

Checked By: RJR

Sample Method: Standard Split Spoon

Completed: April 8, 1999

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Vapour Reading	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0						Ground Surface	0		
						ASPHALT	-0.15		Flushmount Protective Casing
1	1	**17**	67	0		***FILL*** silty sand, dark brown, moist, no odour, no staining, minor coal fragments			
2							-0.76		T.O.P. at 0.22m below ground surface
3 / 1	2	**16**	75	0		***SILTY CLAY*** motled grey/brown, moist, very stiff, no odour, no staining			Concrete
4						becoming reddish brown with grey, occasional pebbles			Bentonite seal
5	3	**26**	75	0					Groundwater at 1.26m below T.O.P. Apr 14/99
6 / 2						becoming mottled grey/brown some red patches,			
7	4	**37**	75	0		hard, occasional pebbles			# 1 Industrial Quartz Sand
8									
9									
10 / 3						becoming greyish brown, very moist, very stiff, occasional pebbles and gravel			
11	5	**27**	50	0					#10 slot PVC screen
12									
13 / 4						refusal at 4.1m (possibly bedrock)	-4.1		
14						End of Borehole			
15									
16									

Groundwater Elevation: 205.72 m (assumed datum)

T.O.P Elevation: 206.98 m (assumed datum)

Monitoring Well Log

Ground Surface Elevation: 207.20 m (assumed datum)

Sheet: 1 of 1

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Well MW99-2

Driller: Maxim Technologies Inc.

Borehole Diameter: 19 cm

Drill Method: Truck-Mounted Acker Soilmax Hollow Stem

Start Date: April 8, 1999

Checked By: RJR

Sample Method: Standard Split Spoon

Completed: April 8, 1999

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Vapour Reading	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0						Ground Surface	0		
1	1	42	50	0		***FILL*** coarse sand with gravel, some silty clay, moist, no odour, no staining, some brick fragments			Flushmount Protective Casing
2							-0.61		T.O.P. at 0.1m below ground surface
3 / 1	2	7	50	0.5		***SILTY CLAY*** brown, becoming reddish brown, firm, moist, no odour, no staining, trace rootlets			
4						becoming hard, damp			
5	3	32	75	2					
6 / 2						becoming mottled grey/brown			Concrete
7	4	60	83	0.5					
8									
9						becoming brown, occasional pebbles and gravel		▽	Groundwater at 2.73m below T.O.P. Apr 14/99
10 / 3	5	47	33	0.5					
11									Bentonite seal
12									
13 / 4									
14						becoming brownish grey, very stiff, occasional pebbles and gravel			# 1 Industrial Quartz Sand
15	6	24	100	0.5					
16									

Groundwater Elevation: 203.598 m (assumed datum)

T.O.P Elevation: 206.328 m (assumed datum)

Ground Surface Elevation: 206.43 m (assumed datum)

Monitoring Well Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Well MW99-2

Driller: Maxim Technologies Inc.

Drill Method: Truck-Mounted Acker Soilmax Hollow Stem

Sample Method: Standard Split Spoon

Borehole Diameter: 19 cm

Start Date: April 8, 1999

Completed: April 8, 1999

Checked By: RJR

Logged By: BW

Depth	Sample No.	N-Value	Recovery (%)	Vapour Reading	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
5									
6	7	20	100	0.5		becoming grey, moist to very moist, occasional pebbles and gravel			#10 slot PVC screen
7							-7.3		
						End of Borehole			
8									
9									

Groundwater Elevation: 203.598 m (assumed datum)

T.O.P Elevation: 206.328 m (assumed datum)

Ground Surface Elevation: 206.43 m (assumed datum)

Monitoring Well Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Well MW99-3

Driller: Maxim Technologies Inc.

Borehole Diameter: 19 cm

Drill Method: Truck-Mounted Acker Soilmax Hollow Stem

Start Date: April 8, 1999

Checked By: RJR

Sample Method: Standard Split Spoon

Completed: April 8, 1999

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Vapour Reading	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0						Ground Surface	0		
1	1	25	50	2		***FILL*** coarse sand with silty clay, moist, no odour, no staining, some brick and concrete fragments			Stick-up Protective Casing
2							-0.61		T.O.P. at 0.65m above ground surface
3 / 1	2	17	75	1.5		***SILTY CLAY*** reddish brown, very stiff, damp, no odour, no staining			
4						becoming mottled grey/ brown, occasional gravel			
5	3	22	75	1.5					
6									Concrete
7 / 2	4	27	75	1.5					Groundwater at 2.685m below T.O.P. Apr 15/99
8									
9						becoming brown, hard, moist, occasional gravel, some pebbles			
10 / 3	5	41	67	1.5					Bentonite seal
11									
12									
13 / 4									
14									# 1 Industrial Quartz Sand
15	6	10	100	2		becoming grey, stiff, very moist, some pebbles and gravel			
16									

Groundwater Elevation: 204.51 m (assumed datum)

T.O.P Elevation: 207.2 m (assumed datum)

Ground Surface Elevation: 206.55 m (assumed datum)

Monitoring Well Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Well MW99-3

Driller: Maxim Technologies Inc.

Borehole Diameter: 19 cm

Drill Method: Truck-Mounted Acker Soilmax Hollow Stem

Start Date: April 8, 1999

Checked By: RJR

Sample Method: Standard Split Spoon

Completed: April 8, 1999

Logged By: BW

Depth	Sample No.	N-Value	Recovery (%)	Vapour Reading	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
5									
17									
18									
19	7	50	n/a	1.5		spoon bouncing (possibly cobble)			
6									
20									#10 slot PVC screen
21									
22							-6.7		
23	8	88	100	0		*CLAYEY SILT* grey, hard, moist, no odour, no staining, occasional pebbles			
7									
24							-7.3		
						End of Borehole			
25									
26									
8									
27									
28									
29									
9									
30									
31									
32									

Groundwater Elevation: 204.51 m (assumed datum)

T.O.P Elevation: 207.2 m (assumed datum)

Ground Surface Elevation: 206.55 m (assumed datum)

Monitoring Well Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-1

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1		1	-	88	0.5		*FILL* coarse sand with gravel, some silty clay, moist, no odour, some discolouration	
2								
3	1							-0.91
4		1	-	88	0.5		*SILTY CLAY* grey, becoming brown, moist, no odour, no staining	
5		2	-	100	1		becoming mottled brown/grey damp	
6	2							-1.8
							End of Borehole	
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-2

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1							***FILL*** sand, gravel, some silty clay, moist, no odour, some dark discolouration, brick fragments	
2		1	-	63	0.5			
3	1							-1.1
4		1	-	63	0.5		***SILTY CLAY*** grey, becoming mottled grey/brown, no odour, no staining	
5		2	-	100	0.5			
6	2							-1.8
							End of Borehole	
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-3

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1							*FILL* sand, some gravel, brown, damp, no odour, no staining, some concrete fragments	
2		1	-	100	0			
3	1							
4								-1.2
5							*SILTY CLAY* mottled grey/brown, damp, no odour, no staining	
6		2	-	100	0.5			
7	2							
8								-2.4
							End of Borehole	
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-4

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
1	1	-	75	1		***FILL*** sand and gravel, grey, some silty clay, moist, no odour, no staining, some brick and concrete fragments	
2							
3 / 1							-0.91
4	1	-	75	1		***SILTY CLAY*** mottled grey/brown, damp, no odour, no staining	-1.2
						End of Borehole	
5							
6 / 2							
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-5

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1		1	-	100	1		*FILL* sand and gravel, dark brown, some silty clay, moist, no odour, no staining, some brick and concrete fragments	
2								-0.61
3	1	1	-	100	1		*SILTY CLAY* mottled grey/brown, damp, no odour, no staining	
4								-1.2
							End of Borehole	
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-6

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
							FILL sand and gravel, grey, moist, no odour, no staining, some brick and concrete fragments	
1		1	-	75	1			
2								
3	1							-0.91
		1	-	75	1		*SILTY CLAY* grey, becoming mottled grey/brown, damp, no odour, no staining becoming moist	
4								
5		2	-	100	0.5			
6	2							-1.8
							End of Borehole	
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface **Elevation:** N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-7

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1		1	-	75	1		*FILL* sand and silty clay, moist, no odour, no staining, some concrete fragments, trace brick fragments	
3	1	1	-	75	0			-0.91
4							*SILTY CLAY* mottled grey/brown, damp, no odour, no staining	-1.2
							End of Borehole	
10	3							
13	4							
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-8

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
							FILL sand, gravel, and silty clay, moist, no odour, no staining	
2		1	-	100	1			
3	1							
4		2	-	100	1		becoming sand, saturated	
5								-1.5
6							*SILTY CLAY* reddish brown, some grey patches, damp, no odour, no staining	
7	2	2	-	100	1			
8								-2.4
							End of Borehole	
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-9

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
						FILL sand with gravel, brown and grey bands in the sand, saturated, no odour, no staining	
2	1	-	50	1.5			
3 / 1							
4						becoming dark brown, no staining	
	2	-	50	1			
							-1.5
5						*SILTY CLAY* grey, becoming mottled grey/brown, moist, no odour, no staining	
6							
7 / 2	2	-	50	1			
							-2.4
8						End of Borehole	
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-10

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
						FILL sand and gravel, dark brown, some silty clay, saturated, no odour, no staining	
1	1	-	67	4			
2						becoming mild hydrocarbon odour, slight hydrocarbon sheen, refusal	-0.91
3 / 1						End of Borehole	
4							
5							
6							
7 / 2							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-11

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1							*FILL* coarse sand, gravel, dark grey, some silty clay, moist, no odour, no staining	
2		1	-	75	1			
3	1							
4								-1.2
5							*SILTY CLAY* grey, damp, no odour, no staining	
6		2	-	88	1		becoming mottled grey/brown	
7	2							
8								-2.4
							End of Borehole	
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-12

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
						FILL sand and gravel, no odour, no staining	
1							
2	1	-	100	2		20 cm layer of coal fragments	
						becoming dark brown, silty clay with sand, saturated	
3 / 1							
4							-1.2
						SILTY CLAY grey, moist, no odour, no staining	
5	2	-	100	1		becoming mottled grey/brown damp	
6 / 2							
7							-2.1
						End of Borehole	
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface **Elevation:** N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-13

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
1	1	-	100	1		*FILL* fine sand and gravel, dark brown, some silty clay, moist, no odour, no staining	
2						refusal	-0.61
						End of Borehole	
3 / 1							
4							
5							
6 / 2							
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-14

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
							FILL	
1		1	-	100	1		sand and gravel, dark grey, some silty clay, moist, no odour, no staining	
							brick fragments	
2							refusal	-0.61
							End of Borehole	
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-15

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
						FILL sand and gravel, dark brown to black, some silty clay, saturated, hydrocarbon odour, slight sheen	
2	1	-	75	10			
3 / 1							
4							-1.2
						SILTY CLAY reddish brown, damp, no odour, no staining	
5							
6	2	-	100	2			
7 / 2							-2.1
						End of Borehole	
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-16

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
	1	-	75	10.5		***FILL*** silty clay, sand, gravel, dark brown to black, saturated, mild hydrocarbon odour, slight sheen	-0.91
3 / 1	1	-	75	1.5		***SILTY CLAY*** grey, moist, no odour, no staining becoming reddish/brown, damp	
5	2	-	100	2			-1.8
6 / 2						End of Borehole	
10 / 3							
13 / 4							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-17

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
						FILL sand and gravel, silty clay, saturated, mild hydrocarbon odour, slight sheen	
2	1	-	50	4			
3 / 1							
4							-1.2
						SILTY CLAY reddish brown, damp, no odour, no staining	
5	2	-	75	3			
6 / 2							-1.8
						End of Borehole	
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-18

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
1							*FILL* sand and gravel, dark grey to black, some silty clay, moist, moderate hydrocarbon odour, some oily stains	
2		1	-	88	6			
3	1							
4								-1.2
5		2	-	75	2		*SILTY CLAY* grey, damp, no odour, no staining becoming reddish brown	
6								-1.8
							End of Borehole	
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-19

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
							FILL sand and gravel, some silty clay, moist, no odour, no staining	
2		1	-	75	3			
3	1						becoming black, mild hydrocarbon odour, oily staining	-1.2
4							*SILTY CLAY* reddish brown, damp, no odour, no staining	
6		2	-	100	1.5			
7	2							
8								-2.4
							End of Borehole	
10	3							
13	4							
16								

Ground Surface Elevation: N / A

Borehole Log

Sheet: 1 of 1

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-20

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft)	Depth (m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0	0						Ground Surface	0
							ASPHALT	
1		1	-	50	1.5		*FILL* coarse sand, some gravel, dark grey, moist, no odour,no staining	
2								-0.61
							SILTY CLAY grey brown	
3	1	1	-	50	2			
4								-1.2
							End of Borehole	
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16								

Ground Surface Elevation: N / A

Borehole Log

XCG Consultants Ltd.

Project No: 5-997-01-04

Project: Additional Phase 2 ESA

Client: Norampac Inc.

Location: Depew, New York

Log of Borehole BH99-21

Driller: Maxim Technologies Inc.

Drill Method: Truck Mounted Geoprobe

Sample Method: 4' Sampler with Plastic Liner

Borehole Diameter: 5cm

Start Date: April 9, 1999

Completed: April 9, 1999

Checked By: RJR

Logged By: BW

Depth (ft / m)	Sample No.	N-Value	Recovery (%)	Soil Vapour (ppm)	Graphic Log	Geology Description	Depth/Elev (m)
0 / 0						Ground Surface	0
1	1	-	75	1.5		*FILL* coarse sand, gravel, dark brown, some silty clay, moist, no odour, no staining	-0.46
2	1	-	75	0.5		*SILTY CLAY* grey, moist, no odour, no staining	-1.2
4 / 1						End of Borehole	
5							
6 / 2							
7							
8							
9							
10 / 3							
11							
12							
13 / 4							
14							
15							
16							

Ground Surface Elevation: N / A

Borehole Log

APPENDIX B

LABORATORY CERTIFICATES OF ANALYSES

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

LABORATORY USE ONLY

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: XCG CONSULTANTS LTD
1 PORT STREET EAST
MISSISSAUGA, ONT

Contact: Basil Wong

Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote # : BL&10 1033

Client P.O. # : _____

Client Project # : 5-9197-01-04

Sampled by: Basil Wong

Page 1 of 2

Analytical methods as per quote

Please specify Guideline (if applicable) NYSDEC TAGM 4046 for metals
NYSDEC ~~TAGM~~ STARS1 For VOC, PAHs

Invoice to (if other than above):
Paul Stokes-Rees
Noramplac Inc.
7830 Tranmere Drive
Mississauga, Ont. L5S 1L9

Analysis Required:

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply, please contact Lab's

STD 5-7 Business Days ✓

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	total metals	VOC	PAHs	Sample Matrix	No. of Containers	Comments/Contamination/ Site History
1	BH99-1 (0-3)			✓			Soil	1	Lab must be
2	BH99-3 (0-4)			✓			"	1	ELAP certified
3	BH99-4 (0-3)			✓			"	1	(New York)
4	BH99-6 (0-3)			✓			"	1	
5	BH99-7 (0-3)			✓			"	1	
6	BH99-8 (0-4)			✓			"	1	
7	BH99-9 (0-4)			✓			"	1	
8	BH99-10 (0-3)			✓	✓	✓	"	3	
9	BH99-13 (0-2)			✓			"	1	
10	BH99-14 (0-2)			✓			"	1	
11	BH99-15 (0-4)			✓	✓	✓	"	3	
12	BH99-17 (0-4)			✓	✓	✓	"	3	

Samples Relinquished to PASC by (Client Signature) _____ Date: Apr 16, 99 Time: 9:05 AM Method of Shipment: Philip Pick-up

Samples Received in lab by: _____ Date: _____ Time: _____ Condition of samples upon receipt at lab: _____

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

LABORATORY USE ONLY

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: XCG Consultants
1 Port Street East
Mississauga, Ont

Contact: Basil Wong

Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote #: BL810 1033

Client P.O. #: _____

Client Project #: 5-997-01-04

Sampled by: Basil Wong

Page 2 of 2

Analytical methods as per quote

Please specify Guideline (if applicable) NYSDEC TAGM 4046 for metals
NYSDEC STARS 1 for VOCs, PAHs

Invoice to (if other than above):
Paul Stokes-Roos
Norampac, Inc.
7830 Tranmere Drive
Mississauga, Ont L5S 1L9

Analysis Required:

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply, please contact Lab

STD 5-7 Business Days ☑

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	4+4 metals	VOCs	PAHs	Sample Matrix	No. of Containers	Comments/Contamination/ Site History
1	BH99-18 (0-4)	Apr 9, 99		✓	✓	✓	Soil	3	Lab must be
2	BH99-19 (0-4)	"		✓	✓	✓	"	3	ELAP certified
3	BH99-20 (0-3)	"		✓			"	1	(New York)
4	BH99-21 (0-2½)	"		✓			"	1	
5	BW1	"		✓			"	1	
6	BW2	"		✓			"	1	
7									
8									
9									
10									
11									
12									

Samples Relinquished to PASC by (Client Signature): _____ Date: Apr 10, 99 Time: 9:05 AM Method of Shipment: Philip Pickup

Samples Received in lab by: _____ Date: _____ Time: _____ Condition of samples upon receipt at lab: _____

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

LABORATORY USE ONLY

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: XCG Consultants Ltd.
1 Port St. East
Mississauga, Ont

Contact: Basil Wong

Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote # : _____

Client P.O. # : _____

Client Project # : _____

Sampled by: _____

Page 1 of 3

Please specify Guideline (if applicable) _____

Invoice to (if other than above):

Analysis Required:

DO NOT ANALYZE YET
HOLD FOR FUTURE ANALYSIS

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply, please contact Lab

STD 5-7 Business Days ☐

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	Sample Matrix	No.of Containers	Comments/Contamination/ Site History
1	MW99-1(½-2)	Apr 8,99		Soil	1	
2	MW99-1(4-6)	"		"	1	
3	MW99-2(0-2)	"		"	1	
4	MW99-2(4-6)	"		"	1	
5	MW99-3(0-2)	"		"	1	
6	MW99-3(2-4)	"		"	1	
7	B1199-1(4-6)	Apr 9,99		"	1	
8	B1199-2(0-½)	"		"	1	
9	B1199-2(4-6)	"		"	1	
10	B1199-3(4-6)	"		"	1	
11	B1199-4(3-4)	"		"	1	
12	B1199-5(0-2)	"		"	1	

Samples Relinquished to PASC by (Client Signature) _____ Date: Apr 10,99 Time: 9:05 AM Method of Shipment: Philip Pick-up

Samples Received in lab by: _____ Date: _____ Time: _____ Condition of samples upon receipt at lab: _____

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

LABORATORY USE ONLY

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: XCG Consultants Ltd.
1 Port St. East
Mississauga, Ont

Contact: Basil Wa...

Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote # : _____

Client P.O. # : _____

Client Project # : _____

Sampled by: _____

Page 2 of 3

Please specify Guideline (if applicable) _____

Invoice to (if other than above):

_____

_____

_____

_____

Analysis Required:

DO NOT ANALYZE YET

HOLD FOR FUTURE ANALYSIS

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply; please contact Lab

STD 5-7 Business Days ☐

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	Sample Matrix	No. of Containers	Comments/Contamination/ Site History
1	B1199-5 (2-4)	Apr 7/99		Soil	1	
2	B1199-6 (4-6)	"		"	1	
3	B1199-7 (3-4)	"		"	1	
4	B1199-8 (6-8)	"		"	1	
5	B1199-9 (7-8)	"		"	1	
6	B1199-11 (6-8)	"		"	1	
7	B1199-11 (4-6)	"		"	1	
8	B1199-12 (6-8)	"		"	1	
9	B1199-12 (5 1/2-7)	"		"	1	
10	B1199-13 (4-7)	"		"	1	
11	B1199-15 (6-8)	"		"	3	
12	B1199-16 (4-6)	"		"	1	

Samples Relinquished to PASC by (Client Signature) _____ Date: Apr 10, 99 Time: 9:05 AM Method of Shipment: Philip Pickup

Samples Received in lab by: _____ Date: _____ Time: _____ Condition of samples upon receipt at lab: _____

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

LABORATORY USE ONLY

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Page 3 of 3

Client: XCG Consultants Ltd
1 Port St. East
Mississauga, Ont

Contact: Basil Wong

Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote # : _____

Client P.O. # : _____

Client Project # : _____

Sampled by: _____

Please specify Guideline (if applicable) _____

Invoice to (if other than above):

Analysis Required:

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply; please contact Lab

STD 5-7 Business Days ☐

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	Sample Matrix	No.of Containers	Comments/Contamination/ Site History
1	B1199-17(4-6)	Apr 7, 99		Soil	1	DO NOT ANALYSE YET
2	B1199-18(4-6)	"		"	1	
3	B1199-19(4-6)	"		"	1	HOLD FOR FUTURE
4	B1199-20(3-4)	"		"	1	ANALYSIS
5	B1199-21(3½-4)	"		"	1	
6						
7						
8						
9						
10						
11						
12						

Samples Relinquished to PASC by (Client Signature) _____ Date: Apr 10, 99 Time: 9:05 AM Method of Shipment: Philip Pickup

Samples Received in lab by: _____ Date: _____ Time: _____ Condition of samples upon receipt at lab: _____

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION

Attention: Basil Wong
Client Name: XCG Consultants Ltd.
Project: 5-997-01-01
Project Desc:

Address: 1 Port St., East
Suite 201
Mississauga, Ontario
L5G 4N1
Fax Number: 905 891-2554
Phone Number: 905 891-2400

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN981300
Date Received: 99/04/10
Date Reported: 99/04/16

Submission No.: 9D0306
Sample No.: 017228-017246

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
All organic data is blank corrected except for PCDD/F, Hi-Res MS and CLP volatile analyses
Solids data is based on dry weight except for biota analyses.
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)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

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. 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 PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

Volatiles were run at a twenty times dilution due to late eluting TPHs that interfered with the analysis.

Certified by:

PHILIP ANALYTICAL SERVICES CORPORATION
5555 North Service Road, Burlington, Ontario, Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

PASC - Certificate of Analysis

			Method Blank	Blank Spike	% Recovery	BH99-1 (0-3)	BH99-1 (0-3)
	Client ID:						Duplicate
	Lab No.:		017228 99	017228 99	017228 99	017229 99	017229 99
	Date Sampled:		99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**					
Metals via SW846 Method 6010/7000 Series							
Arsenic (gfaa)	0.5	mg/kg	<	4.3	86	3.9	3.7
Mercury	0.04	"	<	1.0	100	0.16	0.18
Selenium (gfaa)	0.5	"	<	4.3	86	<2.5	<2.5
Aluminum	3	mg/kg	<30	210	100	10000	10000
Barium	0.1	"	0.1	110	110	130	130
Beryllium	0.1	"	<	52	100	<1.0	<1.0
Cadmium	0.2	"	<	50	100	<2.0	<2.0
Calcium	20	"	50	1100	100	79000	79000
Chromium	0.4	"	<	110	110	440	440
Cobalt	1	"	<	110	110	<10	<10
Copper	0.6	"	<	100	100	940	950
Iron	1	"	7.0	1300	110	33000	33000
Lead	2	"	<	100	100	740	750
Magnesium	5	"	<	1100	100	21000	21000
Manganese	0.5	"	<	100	100	5500	5600
Molybdenum	1	"	<	51	100	26	28
Nickel	1	"	<	52	100	41	44
Phosphorus	6	"	7.0	500	98	1200	1200
Potassium	100	"	<	1000	100	1100	1300
Silver	1.0	"	<	52	100	<10	<10
Sodium	10	"	<	1000	100	710	710
Thallium	6	"	<	110	110	<60	<60
Vanadium	0.5	"	<	52	100	50	49
Zinc	0.5	"	0.5	210	100	980	990

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			BH99-1	BH99-1	BH99-3	BH99-4	BH99-6
Client ID:			(0-3)	(0-3)	(0-4)	(0-3)	(0-3)
Lab No.:			017229 99	017229 99	017230 99	017231 99	017232 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**	M. Spike	MS % Rec.			
Metals via SW846 Method 6010/7000 Series							
Arsenic (gfaa)	0.5	mg/kg	23	46	<2.5	3.9	<2.5
Mercury	0.04	"	1.2	110	0.37	4.5	0.26
Selenium (gfaa)	0.5	"	23	86	<2.5	<2.5	<2.5
Aluminum	3	mg/kg	12000	98	9500	8900	9500
Barium	0.1	"	1100	99	130	110	130
Beryllium	0.1	"	490	98	<1.0	1.1	<1.0
Cadmium	0.2	"	480	96	<2.0	3.0	<2.0
Calcium	20	"	88000	96	120000	65000	120000
Chromium	0.4	"	1400	100	70	49	75
Cobalt	1	"	1000	99	<10	<10	<10
Copper	0.6	"	1900	97	740	20000	480
Iron	1	"	45000	96	22000	25000	18000
Lead	2	"	1700	100	880	20000	210
Magnesium	5	"	31000	94	12000	10000	13000
Manganese	0.5	"	6500	98	570	570	970
Molybdenum	1	"	500	95	<10	<10	<10
Nickel	1	"	540	99	43	250	37
Phosphorus	6	"	5900	95	410	520	940
Potassium	100	"	10000	<	<1000	1400	1000
Silver	1.0	"	460	93	<10	<10	<10
Sodium	10	"	10000	97	350	260	220
Thallium	6	"	1000	99	<60	<60	<60
Vanadium	0.5	"	530	97	22	16	26
Zinc	0.5	"	2900	98	1100	4800	870

			BH99-7	BH99-8	BH99-9	BH99-10	BH99-13
Client ID:			(0-3)	(0-4)	(0-4)	(0-3)	(0-2)
Lab No.:			017233 99	017234 99	017235 99	017236 99	017237 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**					
Metals via SW846 Method 6010/7000 Series							
Arsenic (gfaa)	0.5	mg/kg	6.9	6.7	2.5	4.7	3.4
Mercury	0.04	"	7.1	1.9	1.7	3.3	0.52
Selenium (gfaa)	0.5	"	<2.5	<2.5	<2.5	<2.5	<2.5
Aluminum	3	mg/kg	8800	5800	8100	8000	8400
Barium	0.1	"	1000	410	150	280	62
Beryllium	0.1	"	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	0.2	"	7.2	18	11	10	<2.0
Calcium	20	"	22000	26000	8400	30000	34000
Chromium	0.4	"	57	21	19	50	15
Cobalt	1	"	<10	10	14	13	<10
Copper	0.6	"	10000	19000	27000	20000	31000
Iron	1	"	77000	54000	22000	58000	21000
Lead	2	"	8400	7700	31000	18000	25000
Magnesium	5	"	4300	4100	3000	3800	3400
Manganese	0.5	"	740	810	1700	890	150
Molybdenum	1	"	<10	<10	21	15	11
Nickel	1	"	110	120	560	270	140
Phosphorus	6	"	1200	1000	1300	1100	340
Potassium	100	"	<1000	1100	<1000	<1000	<1000
Silver	1.0	"	<10	<10	<10	17	13
Sodium	10	"	340	460	1200	490	170
Thallium	6	"	<60	<60	<60	<60	64
Vanadium	0.5	"	35	17	15	27	12
Zinc	0.5	"	9700	21000	43000	19000	14000

PASC - Certificate of Analysis

			BH99-14	BH99-15	BH99-15	BH99-15	BH99-15
Client ID:			(0-2)	(0-4)	(0-4)	(0-4)	(0-4)
Lab No.:			017238 99	017239 99	017239 99	017239 99	017239 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**			Duplicate	M. Spike	MS % Rec.
Metals via SW846 Method 6010/7000 Series							
Arsenic (gfaa)	0.5	mg/kg	2.2	12	-	-	-
Mercury	0.04	"	0.10	1.5	1.5	2.4	89
Selenium (gfaa)	0.5	"	<2.5	2.6	-	-	-
Aluminum	3	mg/kg	2400	9300	-	-	-
Barium	0.1	"	24	220	-	-	-
Beryllium	0.1	"	<1.0	1.4	-	-	-
Cadmium	0.2	"	<2.0	7.3	-	-	-
Calcium	20	"	230000	26000	-	-	-
Chromium	0.4	"	20	33	-	-	-
Cobalt	1	"	<10	<10	-	-	-
Copper	0.6	"	2700	24000	-	-	-
Iron	1	"	9200	39000	-	-	-
Lead	2	"	4900	13000	-	-	-
Magnesium	5	"	9700	4500	-	-	-
Manganese	0.5	"	190	1000	-	-	-
Molybdenum	1	"	<10	12	-	-	-
Nickel	1	"	40	57	-	-	-
Phosphorus	6	"	230	1100	-	-	-
Potassium	100	"	<1000	<1000	-	-	-
Silver	1.0	"	<10	<10	-	-	-
Sodium	10	"	360	170	-	-	-
Thallium	6	"	<60	<60	-	-	-
Vanadium	0.5	"	<5.0	21	-	-	-
Zinc	0.5	"	1700	12000	-	-	-

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			BH99-17	BH99-18	BH99-19	BH99-20	BH99-21
Client ID:			(0-4)	(0-4)	(0-4)	(0-3)	(0-2.5)
Lab No.:			017240 99	017241 99	017242 99	017243 99	017244 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**					
Metals via SW846 Method 6010/7000 Series			(1)	(1)	(1)	(1)	(1)
Arsenic (gfaa)	0.5	mg/kg	13	13	16	8.6	10
Mercury	0.04	"	0.91	1.4	0.60	0.29	1.4
Selenium (gfaa)	0.5	"	<2.5	3.4	<2.5	<2.5	<2.5
Aluminum	3	mg/kg	5400	4600	6700	7600	3400
Barium	0.1	"	110	97	170	130	66
Beryllium	0.1	"	<1.0	<1.0	1.1	<1.0	<1.0
Cadmium	0.2	"	3.7	6.0	20	19	3.4
Calcium	20	"	17000	17000	5300	18000	130000
Chromium	0.4	"	16	26	11	13	17
Cobalt	1	"	<10	<10	<10	<10	<10
Copper	0.6	"	11000	2600	60000	38000	7500
Iron	1	"	20000	32000	40000	25000	19000
Lead	2	"	7700	1900	19000	22000	6000
Magnesium	5	"	5400	4200	1400	2800	6300
Manganese	0.5	"	160	920	3100	2100	400
Molybdenum	1	"	<10	<10	20	14	<10
Nickel	1	"	39	34	84	160	51
Phosphorus	6	"	740	440	1900	1500	540
Potassium	100	"	<1000	<1000	<1000	<1000	<1000
Silver	1.0	"	<10	<10	21	<10	<10
Sodium	10	"	120	130	170	300	250
Thallium	6	"	<60	<60	<60	67	<60
Vanadium	0.5	"	17	17	23	22	17
Zinc	0.5	"	3800	1800	29000	30000	3400

	Client ID:		BW1	BW2
	Lab No.:		017245 99	017246 99
	Date Sampled:		99/04/10	99/04/10
Component	**MDL**	**Units**		
Metals via SW846 Method 6010/7000 Series			(1)	(1)
Arsenic (gfaa)	0.5	mg/kg	12	2.9
Mercury	0.04	"	9.9	2.3
Selenium (gfaa)	0.5	"	<2.5	<2.5
Aluminum	3	mg/kg	9300	7700
Barium	0.1	"	1200	130
Beryllium	0.1	"	1.0	<1.0
Cadmium	0.2	"	9.5	9.7
Calcium	20	"	21000	6900
Chromium	0.4	"	78	27
Cobalt	1	"	<10	16
Copper	0.6	"	12000	39000
Iron	1	"	94000	20000
Lead	2	"	9800	46000
Magnesium	5	"	4600	2200
Manganese	0.5	"	780	1400
Molybdenum	1	"	12	22
Nickel	1	"	120	860
Phosphorus	6	"	1400	1300
Potassium	100	"	<1000	<1000
Silver	1.0	"	<10	12
Sodium	10	"	360	740
Thallium	6	"	<60	<60
Vanadium	0.5	"	45	15
Zinc	0.5	"	12000	55000

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			Method Blank	Blank Spike	% Recovery	Blank Spike Duplicate	% Recovery
Client ID:							
Lab No.:			017228 99	017228 99	017228 99	017228 99	017228 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**					
PAH via SW846 Method 8270							
Naphthalene	0.03	mg/kg	<	1.7	83	1.8	89
Acenaphthylene	0.04	"	<	1.7	83	1.8	91
Acenaphthene	0.07	"	<	1.7	85	1.9	93
Fluorene	0.03	"	<	1.7	84	1.8	90
Phenanthrene	0.03	"	<	1.8	91	1.9	95
Anthracene	0.03	"	<	1.6	81	1.7	86
Fluoranthene	0.02	"	<	1.7	83	1.7	87
Pyrene	0.03	"	<	2.1	100	2.2	110
Benz(a)anthracene	0.02	"	<	1.9	93	1.9	94
Chrysene	0.03	"	<	1.9	94	1.9	97
Benzo(b)fluoranthene	0.04	"	<	1.8	88	1.8	91
Benzo(k)fluoranthene	0.04	"	<	1.8	91	1.9	97
Benzo(a)pyrene	0.05	"	<	1.8	89	1.8	91
Indeno(1,2,3-cd)pyrene	0.06	"	<	2.1	100	1.9	94
Dibenzo(ah)anthracene	0.04	"	<	1.8	91	1.8	89
Benzo(ghi)perylene	0.04	"	<	2.0	100	1.9	93
Surrogate Recoveries		%					
d5-Nitrobenzene			70	60	60	53	53
2-Fluorobiphenyl			78	74	74	79	79
d14-p-Terphenyl			88	85	85	91	91

			BH99-10	BH99-10	BH99-15	BH99-17	BH99-18
Client ID:			(0-3)	(0-3)	(0-4)	(0-4)	(0-4)
Lab No.:			017236 99	017236 99	017239 99	017240 99	017241 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**		Duplicate			
PAH via SW846 Method 8270							
Naphthalene	0.03	mg/kg	0.37	0.40	4.2	4.6	3.8
Acenaphthylene	0.04	"	<0.08	<0.08	<0.20	<0.20	<0.40
Acenaphthene	0.07	"	<0.14	0.11	3.4	4.0	<0.70
Fluorene	0.03	"	0.17	0.21	6.9	5.8	<0.30
Phenanthrene	0.03	"	1.3	1.4	15	18	4.6
Anthracene	0.03	"	0.10	0.11	1.8	2.8	2.3
Fluoranthene	0.02	"	0.79	0.93	8.3	20	7.6
Pyrene	0.03	"	0.76	0.86	12	18	12
Benz(a)anthracene	0.02	"	0.42	0.48	3.3	7.2	4.2
Chrysene	0.03	"	0.53	0.65	4.7	8.9	5.0
Benzo(b)fluoranthene	0.04	"	0.61	0.72	4.1	7.3	4.7
Benzo(k)fluoranthene	0.04	"	0.44	0.29	3.6	4.4	2.4
Benzo(a)pyrene	0.05	"	0.53	0.53	3.2	6.0	3.7
Indeno(1,2,3-cd)pyrene	0.06	"	0.54	0.59	3.2	5.2	4.0
Dibenzo(ah)anthracene	0.04	"	0.23	0.20	1.2	1.5	1.5
Benzo(ghi)perylene	0.04	"	0.54	0.59	2.6	4.4	3.4
Surrogate Recoveries		%					
d5-Nitrobenzene			74	66	85	85	85
2-Fluorobiphenyl			88	88	100	100	99
d14-p-Terphenyl			94	94	90	100	116

			BH99-19
	Client ID:		(0-4)
	Lab No.:		017242 99
	Date Sampled:		99/04/10
Component	**MDL**	**Units**	
PAH via SW846 Method 8270			
Naphthalene	0.03	mg/kg	0.58
Acenaphthylene	0.04	"	<
Acenaphthene	0.07	"	0.30
Fluorene	0.03	"	0.36
Phenanthrene	0.03	"	1.7
Anthracene	0.03	"	0.28
Fluoranthene	0.02	"	0.39
Pyrene	0.03	"	0.88
Benz(a)anthracene	0.02	"	0.17
Chrysene	0.03	"	0.24
Benzo(b)fluoranthene	0.04	"	0.18
Benzo(k)fluoranthene	0.04	"	0.11
Benzo(a)pyrene	0.05	"	0.15
Indeno(1,2,3-cd)pyrene	0.06	"	0.16
Dibenzo(ah)anthracene	0.04	"	<
Benzo(ghi)perylene	0.04	"	0.17
Surrogate Recoveries		%	
d5-Nitrobenzene			57
2-Fluorobiphenyl			73
d14-p-Terphenyl			90

			Method Blank	Method Blank	Method Blank	BH99-10 (0-3)	BH99-15 (0-4)
Client ID:							
Lab No.:			017228 99	017228 99	017228 99	017236 99	017239 99
Date Sampled:			99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**		M. Spike	MS % Rec.		
Volatiles via SW846 Method 8260							
Acetone	0.065	mg/kg	<	0.31	120	1.7	<1.3
Acrolein	0.010	"	<	0.43	86	<0.20	<0.20
Acrylonitrile	0.013	"	<	0.48	95	<0.26	<0.26
Benzene	0.001	"	<	0.25	100	0.018	0.030
Bromoform	0.004	"	<	0.26	100	<0.080	<0.080
Bromomethane	0.005	"	<	0.25	99	<0.10	<0.10
2-Butanone	0.012	"	<	0.27	110	<0.24	<0.24
Carbon Disulfide	0.005	"	<	0.26	100	<0.10	<0.10
Carbon Tetrachloride	0.006	"	<	0.26	100	<0.12	<0.12
Chlorobenzene	0.002	"	<	0.27	110	<0.040	<0.040
Chlorodibromomethane	0.004	"	<	0.26	100	<0.080	<0.080
Chloroethane	0.005	"	<	0.25	100	<0.10	<0.10
2-Chloroethylvinylether	0.013	"	<	0.24	94	<0.26	<0.26
Chloroform	0.002	"	<	0.27	110	<0.040	<0.040
Chloromethane	0.005	"	<	0.24	95	<0.10	<0.10
1,2-Dichlorobenzene	0.002	"	<	0.26	100	<0.040	<0.040
1,3-Dichlorobenzene	0.003	"	<	0.25	100	<0.060	<0.060
1,4-Dichlorobenzene	0.004	"	<	0.27	110	<0.080	<0.080
Dichlorobromomethane	0.004	"	<	0.26	100	<0.080	<0.080
1,1-Dichloroethane	0.006	"	<	0.26	110	<0.12	<0.12
1,2-Dichloroethane	0.003	"	<	0.27	110	<0.060	<0.060
1,1-Dichloroethene	0.002	"	<	0.26	100	<0.040	<0.040
Ethylene Dibromide	0.007	"	<	0.26	100	<0.14	<0.14
1,2-Dibromo-3-Chloropropane	0.050	"	<	0.25	100	<1.0	<1.0
cis-1,2-Dichloroethene	0.003	"	<	0.26	100	<0.060	0.70
trans-1,2-Dichloroethene	0.003	"	<	0.25	99	<0.060	<0.060
1,2-Dichloropropane	0.007	"	<	0.26	100	<0.14	<0.14
cis-1,3-Dichloropropene	0.002	"	<	0.24	96	<0.040	<0.040
trans-1,3-Dichloropropene	0.004	"	<	0.24	97	<0.080	<0.080
Ethylbenzene	0.002	"	<	0.28	110	<0.040	0.096
2-Hexanone	0.008	"	<	0.30	120	<0.16	<0.16
Methylene Chloride	0.010	"	0.030	0.29	120	0.47	0.49
4-Methyl-2-Pentanone	0.009	"	<	0.24	94	<0.18	<0.18
Styrene	0.002	"	<	0.28	110	<0.040	<0.040
1,1,1,2-Tetrachloroethane	0.002	"	<	0.27	110	<0.040	<0.040
1,1,2,2-Tetrachloroethane	0.004	"	<	0.26	110	<0.080	<0.080
Tetrachloroethene	0.003	"	<	0.27	110	<0.060	0.24
Toluene	0.002	"	<	0.27	110	0.040	0.12
1,1,1-Trichloroethane	0.003	"	<	0.26	110	<0.060	<0.060
1,1,2-Trichloroethane	0.004	"	<	0.25	100	<0.080	<0.080
Trichloroethene	0.003	"	<	0.26	110	<0.060	<0.060
Vinyl Acetate	0.009	"	<	0.20	80	<0.18	<0.18
Vinyl Chloride	0.003	"	<	0.23	92	<0.060	<0.060

	Client ID:		Method Blank	Method Blank	Method Blank	BH99-10 (0-3)	BH99-15 (0-4)
	Lab No.:		017228 99	017228 99	017228 99	017236 99	017239 99
	Date Sampled:		99/04/10	99/04/10	99/04/10	99/04/10	99/04/10
Component	MDL	Units		M. Spike	MS % Rec.		
m&p-Xylene	0.004	"	<	0.55	110	<0.080	0.27
o-Xylene	0.002	"	<	0.27	110	<0.040	0.19
Isopropylbenzene	0.013	"	<	0.27	110	<0.26	<0.26
Isopropylbenzene	0.003	"	<	0.27	110	<0.060	<0.060
n-Propylbenzene	0.003	"	<	0.27	110	<0.060	0.078
p-Isopropyltoluene	0.003	"	<	0.27	110	0.067	0.10
1,2,4-Trimethylbenzene	0.003	"	<	0.27	110	0.11	0.81
1,3,5-Trimethylbenzene	0.003	"	<	0.28	110	<0.060	0.28
n-Butylbenzene	0.003	"	<	0.27	110	<0.060	<0.060
sec-Butylbenzene	0.003	"	<	0.27	110	<0.060	0.064
t-Butylbenzene	0.003	"	<	0.26	100	<0.060	<0.060
Methyl-t-butylether	0.003	"	<	NS	-	<0.060	<0.060
Surrogate Recoveries		%					
d4-1,2-Dichloroethane			92	100	100	95	92
d8-Toluene			100	103	103	98	96
Bromofluorobenzene			90	101	101	91	87

			BH99-17	BH99-18	BH99-19
Client ID:			(0-4)	(0-4)	(0-4)
Lab No.:			017240 99	017241 99	017242 99
Date Sampled:			99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**			
Volatiles via SW846 Method 8260					
Acetone	0.065	mg/kg	<1.3	<1.3	<1.3
Acrolein	0.010	"	<0.20	<0.20	<0.20
Acrylonitrile	0.013	"	<0.26	<0.26	<0.26
Benzene	0.001	"	0.029	<0.020	0.026
Bromoform	0.004	"	<0.080	<0.080	<0.080
Bromomethane	0.005	"	<0.10	<0.10	<0.10
2-Butanone	0.012	"	<0.24	<0.24	<0.24
Carbon Disulfide	0.005	"	<0.10	<0.10	<0.10
Carbon Tetrachloride	0.006	"	<0.12	<0.12	<0.12
Chlorobenzene	0.002	"	<0.040	<0.040	<0.040
Chlorodibromomethane	0.004	"	<0.080	<0.080	<0.080
Chloroethane	0.005	"	<0.10	<0.10	<0.10
2-Chloroethylvinylether	0.013	"	<0.26	<0.26	<0.26
Chloroform	0.002	"	<0.040	<0.040	<0.040
Chloromethane	0.005	"	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	0.002	"	<0.040	<0.040	<0.040
1,3-Dichlorobenzene	0.003	"	<0.060	<0.060	<0.060
1,4-Dichlorobenzene	0.004	"	<0.080	<0.080	<0.080
Dichlorobromomethane	0.004	"	<0.080	<0.080	<0.080
1,1-Dichloroethane	0.006	"	<0.12	<0.12	<0.12
1,2-Dichloroethane	0.003	"	<0.060	<0.060	<0.060
1,1-Dichloroethene	0.002	"	<0.040	<0.040	<0.040
Ethylene Dibromide	0.007	"	<0.14	<0.14	<0.14
1,2-Dibromo-3-Chloropropane	0.050	"	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	0.003	"	<0.060	<0.060	<0.060
trans-1,2-Dichloroethene	0.003	"	<0.060	<0.060	<0.060
1,2-Dichloropropane	0.007	"	<0.14	<0.14	<0.14
cis-1,3-Dichloropropene	0.002	"	<0.040	<0.040	<0.040
trans-1,3-Dichloropropene	0.004	"	<0.080	<0.080	<0.080
Ethylbenzene	0.002	"	0.11	<0.040	<0.040
2-Hexanone	0.008	"	<0.16	<0.16	<0.16
Methylene Chloride	0.010	"	0.45	0.53	0.71
4-Methyl-2-Pentanone	0.009	"	<0.18	<0.18	<0.18
Styrene	0.002	"	<0.040	<0.040	<0.040
1,1,1,2-Tetrachloroethane	0.002	"	<0.040	<0.040	<0.040
1,1,2,2-Tetrachloroethane	0.004	"	<0.080	<0.080	<0.080
Tetrachloroethene	0.003	"	<0.060	<0.060	<0.060
Toluene	0.002	"	0.15	0.062	0.073
1,1,1-Trichloroethane	0.003	"	<0.060	<0.060	<0.060
1,1,2-Trichloroethane	0.004	"	<0.080	<0.080	<0.080
Trichloroethene	0.003	"	<0.060	<0.060	<0.060
Vinyl Acetate	0.009	"	<0.18	<0.18	<0.18
Vinyl Chloride	0.003	"	<0.060	<0.060	<0.060

			BH99-17	BH99-18	BH99-19
	Client ID:		(0-4)	(0-4)	(0-4)
	Lab No.:		017240 99	017241 99	017242 99
	Date Sampled:		99/04/10	99/04/10	99/04/10
Component	**MDL**	**Units**			
m&p-Xylene	0.004	"	0.25	0.18	0.096
o-Xylene	0.002	"	0.13	0.11	0.049
Isopropylbenzene	0.013	"	<0.26	<0.26	<0.26
Isopropylbenzene	0.003	"	<0.060	<0.060	<0.060
n-Propylbenzene	0.003	"	0.066	<0.060	<0.060
p-Isopropyltoluene	0.003	"	0.095	<0.060	<0.060
1,2,4-Trimethylbenzene	0.003	"	0.39	0.15	0.070
1,3,5-Trimethylbenzene	0.003	"	0.45	<0.060	<0.060
n-Butylbenzene	0.003	"	<0.060	<0.060	<0.060
sec-Butylbenzene	0.003	"	0.066	<0.060	<0.060
t-Butylbenzene	0.003	"	<0.060	<0.060	<0.060
Methyl-t-butylether	0.003	"	<0.060	<0.060	<0.060
Surrogate Recoveries		%			
d4-1,2-Dichloroethane			96	91	89
d8-Toluene			93	96	95
Bromofluorobenzene			91	94	96

Client:XCG Consultants Ltd. Project:5-997-01-01

XCG

FAX TRANSMISSION COVER SHEET

TO:	Ada Blyth	FAX NO.:	905-332-9169
COMPANY:	Philip Analytical Services Corp.		
FROM:	Basil Wong		
DATE:	April 21, 1999		
RE:	Additional Analysis of Soil Samples from Depew, New York		

You should receive 2 Page(s), including this cover sheet. If you do not receive all the pages, please call (905) 891-2400

Original to be forwarded Yes ✔ **No**

Further to our earlier discussions, XCG Consultants Ltd. (XCG) is requesting that additional analysis be conducted on soil samples collected from Depew, New York. The soil samples were picked-up by Philip Analytical Services Corporation on April 10, 1999. Total metals analysis were conducted on select fill samples. Based on these initial results, XCG is requesting that TCLP metals analysis be conducted on a number of these fill samples. In addition, a number of fill and silty clay samples were submitted to PASC for storage for future testing. Total metals analysis is now required for some of these samples. The additional analyses required are summarized as follows:

TCLP Metals Analysis

XCG ID #	*PASC ID #*
BH99-1(0-3)	017229 99
BH99-3(0-4)	017230 99
BH99-6(0-3)	017232 99
BH99-7(0-3)	017233 99
BH99-8(0-4)	017234 99
BH99-10(0-3)	017236 99
BH99-14(0-2)	017238 99
BH99-17(0-4)	017240 99
BH99-18(0-4)	017241 99
BH99-21(0-2.5)	017244 99

XCG Consultants Ltd.
Port Street East, Suite 201
Mississauga, Ontario
Canada
L5G 4N1
Tel: (905) 891-2400
Fax: (905) 891-2554
E-mail: fernando@xcg.com

XCG

FAX TRANSMISSION COVER SHEET

Total Metals Analysis
XCG ID#
BH99-2(0-3.5)
BH99-1(4-6)
BH99-3(4-6)
BH99-4(3-4)
BH99-7(3-4)
BH99-8(5-8)
BH99-9(7-8)
BH99-11(4-6)
BH99-19(4-8)
BH99-15(4-7)
BH99-17(4-6)
BH99-18(4-6)
BH99-20(3-4)
BH99-21(2.5-4)

As we discussed previously, XCG would appreciate it if PASC could attempt to complete the analysis on a five day regular turnaround time (as opposed to seven days). Please fax me a confirmation that you have received this fax and that the analysis have been initiated. If you have any questions, please do not hesitate to call me. Thanks.

Regards,

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Basil Wong
Client: XCG Consultants Ltd.
Re Client Project: 5-997-01-01
FAX #: 905 891-2554
Phone #: 905 891-2400

Samples for: Total Metals (Hg, S, As)
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
017254	BH99-1 (4-6)	99/04/09	99/04/10
017255	BH99-2 (0-3.5)	99/04/09	99/04/10
017257	BH99-3 (4-6)	99/04/09	99/04/10
017258	BH99-4 (3-4)	99/04/09	99/04/10
017262	BH99-7 (3-4)	99/04/09	99/04/10
017263	BH99-8 (5-8)	99/04/09	99/04/10
017264	BH99-9 (7-8)	99/04/09	99/04/10
017266	BH99-11 (4-6)	99/04/09	99/04/10
017269	BH99-15 (4-7)	99/04/09	99/04/10
017272	BH99-17 (4-6)	99/04/09	99/04/10
017273	BH99-18 (4-6)	99/04/09	99/04/10
017274	BH99-19 (4-8)	99/04/09	99/04/10
017275	BH99-20 (3-4)	99/04/09	99/04/10
017276	BH99-21 (2.5-4)	99/04/09	99/04/10

Comments: _____

_____

_____

Date 99/04/22

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Basil Wong
Client: XCG Consultants Ltd.
Re Client Project: 5-997-01-01
FAX #: 905 891-2554
Phone #: 905 891-2400

Samples for: TCLP Metals
were received in good condition unless indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
019210	BH99-1 (0-3)	99/04/10	99/04/21
019212	BH99-3 (0-4)	99/04/10	99/04/21
019214	BH99-6 (0-3)	99/04/10	99/04/21
019216	BH99-7 (0-3)	99/04/10	99/04/21
019218	BH99-8 (0-4)	99/04/10	99/04/21
019220	BH99-10 (0-3)	99/04/10	99/04/21
019222	BH99-14 (0-2)	99/04/10	99/04/21
019224	BH99-17 (0-4)	99/04/10	99/04/21
019226	BH99-18 (0-4)	99/04/10	99/04/21
019228	BH99-21 (0-2.5)	99/04/10	99/04/21

Comments: _____

_____

_____

Date 99/04/22

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION

Attention: Basil Wong
Client Name: XCG Consultants Ltd.
Project: 5-997-01-01
Project Desc:

Address: 1 Port St., East
Suite 201
Mississauga, Ontario
L5G 4N1
Fax Number: 905 891-2554
Phone Number: 905 891-2400

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN981300
Date Received: 99/04/21
Date Reported: 99/04/29

Submission No.: 9D0658
Sample No.: 019209-019229

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
All organic data is blank corrected except for PCDD/F, Hi-Res MS and CLP volatile analyses
Solids data is based on dry weight except for biota analyses.
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)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

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. 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 PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

(2) Suspect chloride interference on silver recovery

Lead failed TCLP criteria for many samples. These are highlighted in the report.

Certified by: _____

PHILIP ANALYTICAL SERVICES CORPORATION
5555 North Service Road, Burlington, Ontario, Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

PASC - Certificate of Analysis

			Method	Blank	% recovery	BH99-1	BH99-1	BH99-1	BH99-1	BH99-3	BH99-6	BH99-7
Client ID:			Blank	Spike		(0-3) TCLP	(0-3) TCLP	(0-3) TCLP	(0-3) TCLP	(0-4) TCLP	(0-3) TCLP	(0-3) TCLP
Lab No.:			019209 99	019209 99	019209 99	019211 99	019211 99	019211 99	019211 99	019213 99	019215 99	019217 99
Date Sampled:			**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**
Component	**MDL**	**Units**					Duplicate	M. Spike	MS % Rec.			
TCLP Metals												
Mercury	0.05	ug/L	<	1.0	100	<	<	1.1	110	<	<	0.07
Arsenic	0.020	mg/L	<0.022	0.54	100	<0.022	-	-	-	0.027	0.023	0.028
Barium	0.001	"	<	1.2	110	0.32	-	-	-	0.23	0.33	1.0
Cadmium	0.002	"	<	0.56	100	0.005	-	-	-	<	<	0.083
Chromium	0.004	"	<	1.2	110	0.15	-	-	-	0.038	0.036	0.016
Lead	0.020	"	<0.022	1.2	110	<0.022	-	-	-	<0.022	<0.022	17
Selenium	0.060	"	<0.066	0.56	110	<0.066	-	-	-	<0.066	<0.066	<0.066
Silver	0.010	"	<0.011	0.58	110	<0.011	-	-	-	<0.011	<0.011	<0.011

PASC - Certificate of Analysis

			BH99-8	BH99-10	BH99-14	BH99-14	BH99-14	BH99-14	BH99-17	BH99-18	BH99-21
Client ID:			(0-4) TCLP	(0-3) TCLP	(0-2) TCLP	(0-2) TCLP	(0-2) TCLP	(0-2) TCLP	(0-4) TCLP	(0-4) TCLP	0-2.5) TCLP
Lab No.:			019219 99	019221 99	019223 99	019223 99	019223 99	019223 99	019225 99	019227 99	019229 99
Date Sampled:			**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**	**99/04/23**
Component	**MDL**	**Units**				Duplicate	M. Spike	MS % Rec.			
TCLP Metals											
Mercury	0.05	ug/L	<	<	< (1)(2)	-	-	-	<	<	<
Arsenic	0.020	mg/L	<0.022	<0.022	0.034	0.036	0.60	100	0.058	0.025	0.036
Barium	0.001	"	0.81	1.0	0.22	0.22	1.4	100	0.63	0.34	0.55
Cadmium	0.002	"	0.21	0.080	0.023	0.021	0.57	100	0.058	0.018	0.038
Chromium	0.004	"	0.018	0.016	0.079	0.080	1.1	96	0.011	0.014	0.023
Lead	0.020	"	**21**	**89**	**25**	**25**	26	79	**100**	**1.1**	**7.0**
Selenium	0.060	"	<0.066	<0.066	<0.066	<0.066	0.64	120	<0.066	<0.066	<0.066
Silver	0.010	"	<0.011	<0.011	<0.011	<0.011	0.20	38(1)	<0.011	<0.011	<0.011

Batch Code:	**0427ABA1**	
Mercury	019209 99	
	019211 99	
	019213 99	
	019215 99	
	019217 99	
	019219 99	
	019221 99	
	019223 99	
	019225 99	
	019227 99	
	019229 99	
Date analysed	99/04/27	
Date prepared	99/04/27	

Batch Code:	**0423ABB1**	**0423ABB2**
Metals	019209 99	019223 99
	019211 99	019225 99
	019213 99	019227 99
	019215 99	019229 99
	019217 99	
	019219 99	
	019221 99	
Date analysed	99/04/27	99/04/29
Date prepared	99/04/23	99/04/23

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION

Attention: Basil Wong
Client Name: XCG Consultants Ltd.
Project: 5-997-01-01
Project Desc:

Address: 1 Port St., East
Suite 201
Mississauga, Ontario
L5G 4N1
Fax Number: 905 891-2554
Phone Number: 905 891-2400

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN981300
Date Received: 99/04/10
Date Reported: 99/04/29

Submission No.: 9D0658
Sample No.: 017254-017255

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
All organic data is blank corrected except for PCDD/F, Hi-Res MS and CLP volatile analyses
Solids data is based on dry weight except for biota analyses.
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)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

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. 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 PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

(1) Native levels in sample are too high to accurately determine spike recoveries.

Certified by:

PHILIP ANALYTICAL SERVICES CORPORATION
5555 North Service Road, Burlington, Ontario, Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

PASC - Certificate of Analysis

			Method	Blank	% Recovery	BH99-1	BH99-1	BH99-1	BH99-1	BH99-2	BH99-3
Client ID:			**Blank**	**Spike**		(4-6)	(4-6)	(4-6)	(4-6)	(0-3.5)	(4-6)
Lab No.:						017254 99	017254 99	017254 99	017254 99	017255 99	017257 99
Date Sampled:						**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**
Component	**MDL**	**Units**					Duplicate	M. Spike	MS % Rec.		
Metals via SW846 Method 6010/7000 Series											
Arsenic (gfaa)	0.5	mg/kg	<	5.3	110	5.3	5.0	55	99	12	<5.0
Mercury	0.04	"	<	0.98	98	<	<	1.0	100	0.32	<
Selenium (gfaa)	0.5	"	<	4.3	86	<5.0	<5.0	40	80	<5.0	<5.0
Aluminum	3	mg/kg	8.0	220	110	13000	14000	16000	(1)	12000	15000
Barium	0.1	"	<	110	110	100	100	210	110	150	110
Beryllium	0.1	"	<	55	110	0.7	0.7	53	100	<	0.7
Cadmium	0.2	"	<	54	110	0.3	<	52	100	12	0.5
Calcium	20	"	<	1100	110	81000	82000	83000	110	72000	73000
Chromium	0.4	"	<	11	110	20	22	120	100	940	22
Cobalt	1	"	<	110	110	11	12	110	99	8.0	12
Copper	0.6	"	<	110	110	24	24	130	110	13000	24
Iron	1	"	<	1300	130	23000	24000	25000	120	42000	25000
Lead	2	"	<	110	110	14	14	110	100	11000	13
Magnesium	5	"	<	1200	120	25000	25000	26000	150	32000	22000
Manganese	0.5	"	<	110	110	570	590	680	100	8500	610
Molybdenum	1	"	<	52	100	1.0	<	44	85	37	<
Nickel	1	"	<	56	110	36	37	87	100	150	38
Phosphorus	6	"	8.0	560	110	610	630	1200	110	1000	600
Potassium	100	"	<	1200	120	2100	2200	3800	170	1200	2600
Silver	1.0	"	<	54	110	<	<	51	100	4.4	<
Sodium	10	"	<	1100	110	270	280	1400	110	470	140
Thallium	6	"	<	120	120	<	<	100	96	8.0	7.0
Vanadium	0.5	"	<	53	110	25	26	77	100	63	26
Zinc	0.5	"	<	220	110	65	66	270	100	9900	67

PASC - Certificate of Analysis

			BH99-4	BH99-7	BH99-8	BH99-9	BH99-11	BH99-15	BH99-17	BH99-18	BH99-19
Client ID:			(3-4)	(3-4)	(5-8)	(7-8)	(4-6)	(4-7)	(4-6)	(4-6)	(4-8)
Lab No.:			017258 99	017262 99	017263 99	017264 99	017266 99	017269 99	017272 99	017273 99	017274 99
Date Sampled:			**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**
Component	**MDL**	**Units**									
Metals via SW846 Method 6010/70											
Arsenic (gfaa)	0.5	mg/kg	<5.0	<5.0	<5.0	18	5.3	8.8	<5.0	9.8	6.0
Mercury	0.04	"	<	<	<	<	<	1.8	<	<	<
Selenium (gfaa)	0.5	"	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Aluminum	3	mg/kg	16000	21000	16000	18000	19000	4800	14000	16000	15000
Barium	0.1	"	120	200	110	130	170	170	100	120	120
Beryllium	0.1	"	0.8	1.0	0.8	1.0	1.1	0.4	0.6	0.8	0.7
Cadmium	0.2	"	0.2	0.3	0.6	0.4	0.7	8.6	0.4	0.5	0.2
Calcium	20	"	58000	4400	77000	33000	2200	54000	75000	17000	68000
Chromium	0.4	"	22	26	22	23	25	27	20	21	22
Cobalt	1	"	12	11	10	15	20	7.0	10	13	12
Copper	0.6	"	55	30	39	65	55	15000	28	29	76
Iron	1	"	26000	31000	25000	47000	41000	33000	23000	36000	25000
Lead	2	"	26	28	16	32	27	6500	19	15	23
Magnesium	5	"	24000	7600	25000	18000	6000	4500	24000	15000	22000
Manganese	0.5	"	630	370	550	610	1200	570	540	1600	560
Molybdenum	1	"	<	1.0	<	3.0	2.0	5.0	<	<	<
Nickel	1	"	37	34	36	41	45	75	35	38	39
Phosphorus	6	"	650	580	660	660	550	590	660	680	610
Potassium	100	"	2300	2300	2300	1900	2100	680	2300	2100	2400
Silver	1.0	"	<	<	<	<	<	4.3	<	<	<
Sodium	10	"	150	79	180	120	83	180	170	95	150
Thallium	6	"	<	<	<	7.0	7.0	<	9.0	<	<
Vanadium	0.5	"	27	30	27	39	34	15	24	28	26
Zinc	0.5	"	81	95	80	120	110	7000	66	74	87

PASC - Certificate of Analysis

			BH99-19	BH99-19	BH99-19	BH99-20	BH99-21
Client ID:			(4-8)	(4-8)	(4-8)	(3-4)	(2.5-4)
Lab No.:			017274 99	017274 99	017274 99	017275 99	017276 99
Date Sampled:			**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**	**99/04/09**
Component	**MDL**	**Units**	Duplicate	M. Spike	MS % Rec.		
Metals via SW846 Method 6010/70							
Arsenic (gfaa)	0.5	mg/kg	-	-	-	6.0	<5.0
Mercury	0.04	"	<	1.1	110	0.10	<
Selenium (gfaa)	0.5	"	-	-	-	<5.0	<5.0
Aluminum	3	mg/kg	-	-	-	14000	17000
Barium	0.1	"	-	-	-	94	130
Beryllium	0.1	"	-	-	-	0.7	0.9
Cadmium	0.2	"	-	-	-	3.6	<
Calcium	20	"	-	-	-	9100	3900
Chromium	0.4	"	-	-	-	16	23
Cobalt	1	"	-	-	-	8.0	10
Copper	0.6	"	-	-	-	220	31
Iron	1	"	-	-	-	22000	26000
Lead	2	"	-	-	-	110	16
Magnesium	5	"	-	-	-	6100	5900
Manganese	0.5	"	-	-	-	440	300
Molybdenum	1	"	-	-	-	2.0	1.0
Nickel	1	"	-	-	-	19	29
Phosphorus	6	"	-	-	-	600	470
Potassium	100	"	-	-	-	1700	1600
Silver	1.0	"	-	-	-	<	<
Sodium	10	"	-	-	-	180	130
Thallium	6	"	-	-	-	<	<
Vanadium	0.5	"	-	-	-	28	31
Zinc	0.5	"	-	-	-	2000	87

Batch Code:	**0422MNA1**	
Arsenic (gfaa)	017254 99	
	017255 99	
	017257 99	
	017258 99	
	017262 99	
	017263 99	
	017264 99	
	017266 99	
	017269 99	
	017272 99	
	017273 99	
	017274 99	
	017275 99	
	017276 99	
Date analysed	99/04/28	
Date prepared	99/04/22	

Batch Code:	**0427HSA1**	**0427HSA2**
Mercury	017254 99	017274 99
	017255 99	017275 99
	017257 99	017276 99
	017258 99	
	017262 99	
	017263 99	
	017264 99	
	017266 99	
	017269 99	
	017272 99	
	017273 99	
Date analysed	99/04/28	99/04/28
Date prepared	99/04/27	99/04/27

Batch Code:	**0422MNA1**
Selenium (gfaa)	017254 99
	017255 99
	017257 99
	017258 99
	017262 99
	017263 99
	017264 99
	017266 99
	017269 99
	017272 99
	017273 99
	017274 99
	017275 99
	017276 99
Date analysed	99/04/27

PASC - Summary of Analysis Pre. Dates

Date prepared	99/04/22	
Batch Code:	**0422MNB1**	**0422MNB1**
Metals	017254 99	017257 99
	017255 99	017262 99
	017258 99	017272 99
	017263 99	017273 99
	017264 99	
	017266 99	
	017269 99	
	017274 99	
	017275 99	
	017276 99	
Date analysed	99/04/26	99/04/28
Date prepared	99/04/22	99/04/22

Client:XCG Consultants Ltd. Project:5-997-01-01

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

BURLINGTON

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: XCG Consultants Ltd.
1 Port Street East
Mississauga, Ont
Contact: Basil Wong
Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote #: BL 810 1033

Client P.O. #: _____

Client Project #: 5-067-01-04

Sampled by: Basil Wong

Please specify Guideline (if applicable) NYSDEC STARS M4046

Page 1 of 2

Invoice to (if other than above):
Paul Stokes-Rees
Novamgas, Inc.
7830 Tranmere
Mississauga, Ont L5S 1L9

Analysis Required:

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply, please contact Lab

STD 5-7 Business Days ☑

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	TCLP metals	Sample Matrix	No. of Containers	Comments/Contamination/ Site History
1	SURF 1	Apr 14/99		/	Soil	1	Lab must be
2	SURF 2	"		/	"	1	ELAP certified
3	SURF 3	"		/	"	1	(New York)
4	SURF 4	"		/	"	1	
5	SURF 5	"		/	"	1	
6	SURF 6	"		/	"	1	
7	SURF 7	"		/	"	1	
8	SURF 8	"		/	"	1	
9	SURF 9	"		/	"	1	
10	SURF 10	"		/	"	1	
11	SURF 11	"		/	"	1	
12	SURF 12	"		/	"	1	

Samples Relinquished to PASC by (Client Signature): _____ Date: Apr 15, 99 Time: 9:15 AM Method of Shipment: PASC Pick up

Samples Received in lab by: _____ Date: Apr 15/99 Time: 9:15 AM Condition of samples upon receipt at lab:

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

PHILIP ANALYTICAL SERVICES CORPORATION — LA[redacted]TOR[redacted]ONL[redacted]

5735 McAdam Road
Mississauga, Ontario L4Z 1N9

Burlington

Tel: (905) 890-8566
Fax: (905) 890-8575
Wats: 1-800-263-9040

Work Order: _____

Comments: _____

CHAIN OF CUSTODY RECORD

Client: KCA Consultants Ltd.
1 Port Street East
Mississauga, Ont

Contact: Basil Wong
Phone: 905-891-2400 Fax: 905-891-2554

PASC Quote #: BL810 1033

Client P.O. #: _____

Client Project #: 5-197-01-04

Sampled by: Basil Wong

Please specify Guideline (if applicable) NYSDEC TAGM 4046

Page 2 of 2

Invoice to (if other than above):
Paul Stakes Rans
Nevamar, Inc.
7830 Tranmere Drive
Mississauga, Ont

Analysis Required:

TAT (Turnaround Time)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

*some exceptions apply, please contact Lab

STD 5-7 Business Days ☑

RUSH Specify Date _____

Time _____

Sample #	Client Sample I.D.	Date Sampled	Time Sampled	TCLP metals	metals, inc. As, Se, Hg	Sample Matrix	No. of Containers	Comments/Contamination/ Site History
1	BW3	Apr 14/99		✓		Soil	1	
2	MW99-1	April 14/99			✓	Groundwater	2	
3	MW99-2	"			✓	"	2	
4	MW99-3	"			✓	"	2	
5	BW4	"			✓	"	2	
6								
7								
8								
9								
10								
11								
12								

Samples Relinquished to PASC by (Client Signature): [signature] Date: Apr 15, 99 Time: 9:10 AM Method of Shipment: PASC Pickup

Samples Received in lab by: [signature] Date: [illegible] Time: 9:15 [illegible] Condition of samples upon receipt at lab:

White: Philip Yellow: Mail Pink: Receiver Goldenrod: Client

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION

Attention: Basil Wong
Client Name: XCG Consultants Ltd.
Project: 5-997-01-01
Project Desc:

Address: 1 Port St., East
Suite 201
Mississauga, Ontario
L5G 4N1
Fax Number: 905 891-2554
Phone Number: 905 891-2400

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN981300
Date Received: 99/04/15
Date Reported: 99/04/29

Submission No.: 9D0486
Sample No.: 018218-018231

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
All organic data is blank corrected except for PCDD/F, Hi-Res MS and CLP volatile analyses
Solids data is based on dry weight except for biota analyses.
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)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

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. 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 PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

Certified by:

PHILIP ANALYTICAL SERVICES CORPORATION
5555 North Service Road, Burlington, Ontario, Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

PASC - Certificate of Analysis

			Method	Blank	% Recovery							
	Client ID:		Blank	Spike		SURF 1	SURF 2	SURF 3	SURF 4	SURF 5	SURF 6	SURF 7
	Lab No.:		018218 99	018218 99	018218 99	018219 99	018220 99	018221 99	018222 99	018223 99	018224 99	018225 99
	Date Sampled:		99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14
Component	**MDL**	**Units**										
Metals via SW8448 Method 6010												
Aluminum	3	mg/kg	<	210	100	3100	2300	7600	9300	9100	8500	8100
Barium	0.1	"	<	110	110	32	28	110	110	110	110	340
Beryllium	0.1	"	<	53	110	0.2	0.2	0.6	0.5	0.5	0.5	0.6
Cadmium	0.2	"	<	51	100	2.8	2.6	5.7	5.6	4.5	3.7	10
Calcium	20	"	<	1100	110	180000	190000	38000	22000	59000	71000	62000
Chromium	0.4	"	<	100	100	20	24	22	20	22	20	37
Cobalt	1	"	<	100	100	3.0	2.0	10	11	9.0	8.0	8.0
Copper	0.6	"	0.8	100	100	3600	1300	11000	10000	7800	5200	8200
Iron	1	"	3.0	1300	100	10000	11000	22000	24000	22000	21000	34000
Lead	2	"	<	110	110	5400	1800	11000	10000	7100	4900	5300
Magnesium	5	"	<	1100	100	11000	10000	7600	6300	13000	18000	7800
Manganese	0.5	"	<	110	110	280	230	620	610	540	540	710
Molybdenum	1	"	<	50	100	2.0	2.0	8.0	8.0	6.0	4.0	7.0
Nickel	1	"	1.0	54	110	54	51	160	180	140	110	97
Phosphorus	6	"	<	540	110	280	260	1000	970	890	700	890
Potassium	100	"	<	1000	110	400	350	930	900	1100	1300	910
Silver	1.0	"	<	52	100	1.5	<	2.4	1.7	1.3	<	2.2
Sodium	10	"	<	1000	100	200	170	720	560	370	460	490
Thallium	6	"	<	110	100	<	<	<	<	<	10	<
Vanadium	0.5	"	<	50	99	6.8	5.7	16	18	18	17	18
Zinc	0.5	"	0.6	200	100	2900	1900	16000	15000	11000	8200	9800

PASC - Certificate of Analysis

Client ID:			SURF 8	SURF 9	SURF 10	SURF 11	SURF 12	BW3
Lab No.:			018226 99	018227 99	018228 99	018229 99	018230 99	018231 99
Date Sampled:			99/04/14	99/04/14	99/04/14	99/04/14	99/04/14	99/04/14
Component	**MDL**	**Units**						
Metals via SW8448 Method 6010								
Aluminum	3	mg/kg	8200	10000	7400	7100	4600	9700
Barium	0.1	"	240	120	75	75	54	130
Beryllium	0.1	"	0.5	0.5	0.4	0.4	0.2	0.6
Cadmium	0.2	"	5.4	1.4	1.2	3.2	2.0	6.4
Calcium	20	"	46000	60000	75000	78000	100000	26000
Chromium	0.4	"	38	37	52	100	99	22
Cobalt	1	"	7.0	6.0	6.0	6.0	4.0	11
Copper	0.6	"	3200	360	430	250	240	12000
Iron	1	"	29000	18000	18000	19000	17000	25000
Lead	2	"	2600	330	440	290	280	12000
Magnesium	5	"	9700	11000	16000	15000	20000	6500
Manganese	0.5	"	550	660	710	1000	1200	670
Molybdenum	1	"	3.0	1.0	2.0	7.0	4.0	9.0
Nickel	1	"	53	30	30	31	31	200
Phosphorus	6	"	670	510	460	510	340	1000
Potassium	100	"	920	1400	1200	1000	620	980
Silver	1.0	"	<	<	<	<	<	2.3
Sodium	10	"	160	240	290	240	510	580
Thallium	6	"	6.0	<	<	<	7.0	6.0
Vanadium	0.5	"	20	20	17	20	16	19
Zinc	0.5	"	4300	550	620	460	400	17000

PASC - Summary of Analysis Pre. Dates

Batch Code:	**0422MNB2**
Metals	018218 99
	018219 99
	018220 99
	018221 99
	018222 99
	018223 99
	018224 99
	018225 99
	018226 99
	018227 99
	018228 99
	018229 99
	018230 99
	018231 99
Date analysed	99/04/28
Date prepped	99/04/22

Client:XCG Consultants Ltd. Project:5-997-01-01

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION

Attention: Basil Wong
Client Name: XCG Consultants Ltd.
Project: 5-997-01-01
Project Desc:

Address: 1 Port St., East
Suite 201
Mississauga, Ontario
L5G 4N1
Fax Number: 905 891-2554
Phone Number: 905 891-2400

LABORATORY INFORMATION

Contact: Ada Blythe, B.Sc., C.Chem.
Project: AN981300
Date Received: 99/04/15
Date Reported: 99/04/30

Submission No.: 9D0486
Sample No.: 018232-018236

NOTES: *'-' = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available*
LOQ can be determined for all analytes by multiplying the appropriate MDL X 3.33
All organic data is blank corrected except for PCDD/F, Hi-Res MS and CLP volatile analyses
Solids data is based on dry weight except for biota analyses.
Organic analytes are not corrected for extraction recovery standards except for isotope dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

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. 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 PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

Certified by:

PHILIP ANALYTICAL SERVICES CORPORATION
5555 North Service Road, Burlington, Ontario, Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

PASC - Certificate of Analysis

			Method	Blank	% Recovery							
			Blank	Spike		MW99-1	MW99-1	MW99-1	MW99-1	MW99-2	MW99-3	BW4
Client ID:												
Lab No.:			018232 99	018232 99	018232 99	018233 99	018233 99	018233 99	018233 99	018234 99	018235 99	018236 99
Date Sampled:			99/04/15	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15	99/04/15
							Duplicate	M. Spike	MS % Rec.			
Component	**MDL**	**Units**										
Metals via SW846 Method 6010/7000 Series												
Arsenic (gfaa)	0.0020	mg/L	<	0.052	100	<	-	-	-	<	<	<
Mercury	0.05	ug/L	<	1.0	100	<	-	-	-	<	<	<
Selenium (gfaa)	0.0020	mg/L	<	0.053	110	<	-	-	-	<	<	<
Aluminum	0.030	mg/L	<	1.9	96	0.36	0.39	2.5	110	0.080	0.034	0.68
Barium	0.001	"	<	0.98	98	0.081	0.083	1.1	100	0.14	0.054	0.092
Beryllium	0.001	"	<	0.48	96	<	<	0.50	100	<	<	<
Cadmium	0.002	"	<	0.48	95	0.002	<	0.50	100	<	0.002	<
Calcium	0.20	"	0.43	9.7	93	72	75	87	140	130	100	81
Chromium	0.004	"	<	0.98	97	<	0.005	1.0	100	<	0.005	0.005
Cobalt	0.010	"	<	0.97	96	<	<	1.0	100	<	<	<
Copper	0.005	"	0.006	0.98	97	0.024	0.025	1.0	100	0.006	<	0.049
Iron	0.010	"	0.012	12	97	0.39	0.47	13	100	0.32	0.076	0.97
Lead	0.020	"	<	0.97	96	0.026	<	1.0	99	<	0.027	0.035
Magnesium	0.050	"	<	10	93	78	80	93	130	130	52	82
Manganese	0.006	"	<	0.96	95	0.063	0.065	1.1	100	0.065	0.036	0.077
Molybdenum	0.010	"	<	0.46	93	<	<	0.49	96	<	<	0.010
Nickel	0.010	"	<	0.49	96	0.023	0.021	0.53	100	0.039	0.024	0.020
Phosphorus	0.060	"	<	4.7	94	<	0.063	5.2	100	0.089	<	0.066
Potassium	1.000	"	<	9.8	100	2.0	1.8	12	100	8.3	2.6	2.1
Silver	0.010	"	<	0.49	97	<	<	0.50	100	<	<	<
Sodium	0.100	"	<	9.4	95	64	66	77	120	25	26	70
Thallium	0.060	"	<	0.98	98	<	<	1.0	100	<	<	<
Vanadium	0.005	"	<	0.47	94	<	<	0.49	99	<	<	<
Zinc	0.005	"	<	1.9	96	0.020	0.025	2.0	100	0.007	<	0.057

PASC - Summary of Analysis Pre. Dates

Batch Code:	**0428ABC1**
Arsenic (gfaa)	018232 99
	018233 99
	018234 99
	018235 99
	018236 99
Date analysed	99/04/26
Date prepared	99/04/28
Batch Code:	**0420MGB1**
Mercury	018232 99
	018233 99
	018234 99
	018235 99
	018236 99
Date analysed	99/04/20
Date prepared	99/04/20
Batch Code:	**0428ABC1**
Selenium (gfaa)	018232 99
	018233 99
	018234 99
	018235 99
	018236 99
Date analysed	99/04/27
Date prepared	99/04/28
Batch Code:	**0428ABC1**
Metals	018233 99
	018234 99
	018235 99
	018236 99
Date analysed	99/04/29
Date prepared	99/04/28