

Groundwater Sampling Investigation Report

for

Village of Lake Linden
Torch Lake Superfund Site
Lake Linden, Michigan

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Report Prepared By:

Date: _____

Barbara Vetort Tiffany
Geologist

Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section
Geological Support Unit
P.O. Box 30426
Lansing, Michigan 48909

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1.0 INTRODUCTION

1.1 General Summary

This report has been prepared by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD), Superfund Section, Geological Support staff with the assistance of additional MDEQ Superfund staff.

This work was conducted to further evaluate exposure pathways identified during the United States Environmental Protection Agency (U.S. EPA) August 2007 emergency removal action, and to investigate agency and citizen reports of “blue water” discharging onto the Lake Linden beach and into the creek adjacent to the beach. This sampling effort is designed to screen for likely groundwater discharge locations along the Lake Linden stamp sands, and to collect samples of groundwater prior to its discharging into the Torch Lake surface water body.

The collection and analysis of this data responds to remedy protectiveness issues identified in the Second U.S. EPA Five-Year Review dated June 2008, and will provide additional site characterization data for the U.S. EPA scope of work and the MDEQ site assessment efforts.

1.2 Property Location

The Lake Linden property is located in Houghton County, Michigan. See Figure 1 for the Property Location map. Generally, the Lake Linden study area is the large stamp sand peninsula deposited as a byproduct of historic industrial mining operations, as well as the Lake Linden Public Park and Boat Dock area. The Torch Lake Water and Sewer Authority currently operates two municipal wastewater treatment lagoons on the interior of this peninsula. Figure 2 is a map of the general Site Features. The Lake Linden stamp sand study area is located at 1000 Hiltunen Street, village of Lake Linden, Michigan.

1.3 Property History

Torch Lake is approximately 2,700 acres in size. The Torch Lake Superfund site is comprised of 13 separate parcels ranging in size from approximately 10 acres to over 200 acres. The parcels are located around the Keweenaw Peninsula in Houghton County, Michigan. The Lake Linden stamp sands parcel is considered part of the Operable Unit (OU) 1 area of the Torch Lake Superfund site. The parcels are mainly the remnants and effects from over 100 years of copper mining, milling, smelting, and reclamation operations, from which five million tons of native copper was produced. Approximately 200 million tons of mining wastes (mostly mill tailings or stamp sands), were dumped into Torch Lake, filling at least 20 percent of the lake's original volume. Approximately 800 acres of Superfund mine tailing and poor rock piles are located throughout the Keweenaw Peninsula at various locations where mining and milling operations were conducted, including approximately 500 acres along the western shore of Torch Lake.

Copper mining activities in the area occurred from the 1880s until 1969 that produced mill tailings (stampsands) and industrial chemical mining waste that contaminated the lake sediments and shoreline. Copper reclamation activities still exist today.

The western shoreline of Torch Lake is largely residential and recreational development with some forested areas and surface water bodies. There is some businesses and industry in the area, but the primary business and commerce now focuses on recreation and tourism. The western shoreline of Torch Lake is further influenced by the presence of historical mining buildings and facilities and some remnants. Most of these buildings have their industrial pipings or hydraulic connections still existing to Torch Lake because Torch Lake provided the water for the industrial processes and was the repository for the majority of the mining waste and debris associated with the copper production.

The Torch Lake contaminated sediments are thought to be 70 feet thick in some areas. The agencies have never collected boring or core samples from the lake bottom sediments that reached native materials. The stampsands deposited in Torch Lake and on the shoreline were dredged up during the early 1900's through at least 1930 and were reprocessed with flotation chemicals or chemically leached to reclaim copper. The stampsands, mining wastes, byproducts, and most of the flotation chemicals were deposited to the lake and the shoreline. Torch Lake also received mine pumpage, leaching chemicals, and explosive residues and by-products. In 1972, an estimated 27,000 gallons of cupric ammonium carbonate were released into the lake from storage vats and barrels that have been found at several sites along the shoreline of the lake.

The Torch Lake site was placed on the National Priorities List in June 1986. By 1994, remedies were selected to address only the mine tailings and Torch Lake itself. The remedies do not address the other potential sources of contamination such as the stamp mill, leaching plants or waste disposal areas from the mining operations. The OU1 and OU3 remedies primarily address ecological impacts. The most significant ecological impact is the severe degradation of the benthic communities (bottom dwelling aquatic organisms) in Torch Lake as a result of metal loadings from the mine tailings located along and near the shore. The primary components of the OU1 and OU3 remedies are a soil and vegetative cover over the tailing piles to reduce metal loadings to the lake and hopefully promote natural recovery of the bottom of the lake. Long-term monitoring of the lake is also called for to measure and verify the lake's ecological recovery progress. By late 1998, the remedial action phase was initiated for the Torch Lake site and the U.S. EPA began to investigate the long-term monitoring requirements of the remedy. In 2007, the U.S. EPA performed an emergency removal in the Lake Linden area to remove chemical waste at the public park.

The only active industry on the Torch Lake shoreline is the Peninsula Copper Company Inc. (PCI), which reclaims copper oxide from scrap electronic circuit boards. During the early 1980s, the company dumped processing water, containing 2,400 times the local sewage authority's allowable limits for copper and 100 times the limit for ammonia, into the Tamarack Sewage lagoon system. Currently, the PCI has performed a hydrogeologic investigation and subsequently submitted data to the MDEQ RRD Calumet district staff. This data has revealed that PCI is a source of contamination to groundwater that ultimately discharges to Torch Lake.

2.0 PUSHPOINT SAMPLING INVESTIGATION

2.1 Objectives

The purpose of this sampling program was to collect data to help document the public health and environmental concerns associated with the Torch Lake and Lake Linden stamp sands property, to provide laboratory analytical data indicating the potential contamination characteristics associated with Lake Linden area, and to provide data to refine future investigations.

The objectives of this investigation work were as follows.

- Improve the understanding of the interaction between surface water and groundwater in the shallow stamp sand aquifer (Lake Linden stamp sands), by monitoring spatial and temporal variations in temperature and specific conductivity at or near the groundwater discharge zone;
- Evaluate if contaminated materials present in the mining wastes adjacent to Lake Linden are being transported to the surface water through shallow groundwater pathways;
- Identify where groundwater discharges and sample the spatial and temporal variations of these discharges;
- Provide the information necessary to help set priorities for further investigations to quantify the extent of contamination if needed.

2.2 Sampling and Analysis

This investigation was accomplished in phases. First, a coarse screening area was established, followed by a second detailed targeted evaluation targeted on anomalies identified in the first phase.

The screening sample locations were based on historic site usage and human exposure areas associated with the current site use. Figure 3 identifies the sampling locations that were screened in high resolution. This high resolution area includes several transects and step outs around data anomalies that were collected to identify potential areas to sample. The entire Lake Linden shoreline was screened, although on a broader scale, see Figure 4. The screening results are contained in Table 1.

These screening level results were evaluated for anomalies and sample locations selected based on our wholistic initial screening. Due to limited funding, all the screening locations could not be sampled for analytical data. There were also two tiers of analytical scans for sampling at analytical sampling locations, and some locations were sampled for inorganic constituents and metals. Some locations were also selected for a full analytical scan. Some groundwater samples were analyzed for volatile organic, semi-volatile organic, pesticide, polychlorinated biphenyl (PCB) compounds, and full inorganic parameters by the MDEQ laboratory according to the appropriate methods provided in the

MDEQ RRD Operational Memorandum No. 2, dated July 5, 2007. Some groundwater samples were only analyzed for total metals and inorganics to more efficiently use our limited sampling funds. Water samples were field preserved using sodium hydroxide to a hydrogen ionization potential (pH) greater than 12 for cyanide analysis, preserved using nitric acid to a pH less than two for total metals analysis, or preserved using five drops of hydrochloric acid per vial for volatile organic compounds analysis. Acid/base neutral and PCB/pesticide analysis water samples were not preserved per protocols.

Samples were labeled, sealed in individual plastic bags, and placed in shipment coolers. The interior of the shipment coolers was kept at a temperature of approximately four degrees Celsius with ice and delivered to the MDEQ laboratory. Standard sample identity, security, and chain of custody procedures specified by the MDEQ were followed.

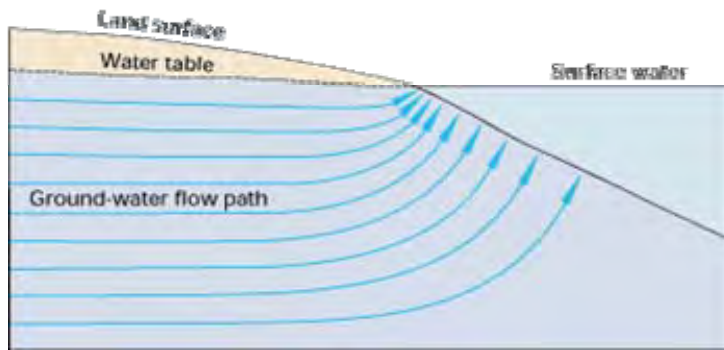
Sediment cores, various metallic objects, and bag samples were collected of surficial sands and objects of interest. These were analyzed using the x-ray fluorescence (XRF) analyzer. The XRF sampling methods are included in Appendix D.

In-situ screening with the XRF analyzer provides qualitative and semi-quantitative results to profile contaminant levels. The XRF analyzers can be placed directly on the soil surface, for in-situ soil analysis with screening-level results. The XRF analyzer was placed on the surface of cuts made into the sediment cores. The XRF analyzers can be used to test bagged or prepared samples. Measuring bagged samples roughly homogenizes the samples, generally making them more representative of the locations where they were collected.

These following two methods are also referred to as ex-situ analysis. These techniques comply with the US EPA Method 6200 and are the industry standard for site characterization, on-site clearance screening, soil stabilization, and remediation quality control. Drying, grinding, and sifting the sample provides a more uniform composition, making quantitative analysis possible. So for true lab-grade analytical data, full sample preparation (dried, ground, sifted, and cupped) is necessary while running the XRF analyzer for longer times.

2.3. Investigation Methods

Samples were collected using PushPoint Samplers (PPS). The PPS is essentially a small diameter micro well. The PPS allows for the collection of groundwater at depths up to six feet below sediment level. The PPS port has a small mesh stainless steel screen. See Appendix A for the methods and a description of the sampler device. The PPS technique is based on the principles of the hydrologic cycle, that precipitation causes infiltration into the aquifer and recharges groundwater. Groundwater is always flowing under base flow conditions and discharges into the surface water.



USGS Figure. Ground water is the second smallest of the four main pools of water on Earth, and river flow to the oceans is one of the smallest fluxes, yet ground water and surface water are the components of the hydrologic system that humans use most. (Modified from Schelesinger, W.H., 1991, *Biogeochemistry-An analysis of global change*: Academic Press, San Diego, California.)

The conceptual site model for the Lake Linden stampsands is loosely based on the above concepts. Torch Lake was about 121 feet deep in the current location of the Lake Linden stampsand peninsula, now the stampsands have filled Torch Lake to approximately 30 feet above lake level. These stampsands and other mining wastes were dumped, deposited, dredged, and reworked throughout the active copper mining era. There are some isolated areas identified where fine clay particles have been deposited, and many of the PPS locations did encounter a very hard layer that varied from one to two feet below the top of sediment, whereas other areas have fine to medium sand grain sizes. The stampsands have both small-scale heterogeneities and possible large scale heterogeneities with respect to hydraulic gradient over short distances, causing preferential groundwater flow paths that discharge to Torch Lake.

This study used field data such as temperature, hydraulic head measurements, specific conductivity, pH and hydraulic gradients to demonstrate the groundwater showed potential to discharge to the lake. In conducting this assessment, the PPS was used first to survey potential groundwater discharge zones based on differences in conductivity, temperature, and hydraulic heads. The primary driver for groundwater discharge at Torch Lake is the hydraulic gradient in the stampsand aquifer. The hydraulic gradient is the pressure difference between two points caused by different water levels driving the flow of the groundwater. Temperature was also used to identify areas of groundwater seepage that may be either warmer or colder than the surface water depending on seasonal and site specific conditions. Conductivity measurements were taken and compared to the surface water. Conductivity is affected by clay content and the presence of dissolved constituents in the groundwater. At several locations a PPS screen sock was required to help reduce turbidity. For this site, the contrast in conductivity was not as great, with the groundwater generally having a higher conductivity than surface water. The PPS was advanced in the surface waters to depths of three feet and five feet below the sediment-water interface. Water was collected by syringe for screening samples. Water samples were collected with peristaltic pumps for laboratory analysis.

There was a coarse field screening grid established for the entire Lake Linden stampsand shoreline and a high resolution field screening grid for the Lake Linden recreation areas and former mining industrial areas, see Figures 3 and 4. Lake Linden sands are

comprised entirely of fill material and it was anticipated that the fill material had radial groundwater flow discharging to the Torch Lake water body around the infiltration lagoons. To identify the likely areas of groundwater discharge, vertical transects were created in several areas to delineate the discharge locations. The vertical transects were perpendicular to the shoreline. The PPS was utilized in about two feet of surface water. Based on professional judgment and the vertical transects this was the area determined to be where the upland groundwater discharged.

The coarse shoreline grid was established and the screening samples were collected about every 100 to 200 lineal feet using temperature, pH, oxidation/reduction potential (ORP), and conductivity to delineate discharge locations. The high resolution grid sample location was established along the Lake Linden beach, and the U.S. EPA emergency removal area up to the Lake Linden Marina. Screening samples here were collected as close as every 10 lineal feet or further as the field data indicated. All the screening data was utilized to determine the optimum areas to collect groundwater samples for full or partial scan laboratory analysis.

The water samples were collected using low-flow technique. Sample containers were filled directly from the peristaltic pump tubing. The PPS vertical screened intervals were set so that the screened area was approximately three feet and up to six feet beneath the sediment water interface at the depth of interest. Field Screening Data is in Table 1.

In several locations step outs were used around areas to identify the zones of highest contamination. These step outs were around the emergency removal areas; the areas where blue water was reported to have been present, and areas of field parameter anomalies.

These step out locations are located very close together usually within three feet and are difficult to depict on a map. The step outs were performed around an area of interest or an area that demonstrated a field screening anomaly. The steps outs were performed until the anomalies were completely characterized. The global positioning system (GPS) sample location data for step outs are included in Appendix F.

The PPS groundwater sample locations chosen for laboratory analysis were developed using a peristaltic pump until a steady flow rate is established. Water removed from the well during development and purging was tested for temperature, pH, conductivity, oxidation reduction potential, and turbidity to ensure that the well has stabilized prior to the collection of the field screening or water samples. Table 5 contains the low-flow sampling field parameters.

At some locations, soil/sediment cores were collected. These cores were located in areas where heterogeneities or field screening anomalies were detected. Cores were analyzed using the XRF. The XRF sample results are reported in Table 4. Figure 6 contains the core sample locations. The XRF raw data table is included in Appendix D.

2.4 Location Survey

Locations of noted site reconnaissance features and sampling points are identified on the sampling figures provided. Field investigative teams utilized a map provided in the work plan to note property features and all sample locations. Sample points were sub-meter GPS surveyed at or near the time of sample collection. Field measurements were also collected with a GPS unit and all information was transferred to a scaled property map during preparation of the PPS investigation report.

There was a technical malfunction of the GPS unit, and some data collected on Thursday, August 7, 2008, was lost. This data loss affects locations of H209 and H225. To resolve this problem and relocate those samples, the team went back to the site on October 14, 2008. Sample blue water, BW, was collected at this location. The team went to the beach area and performed step outs until the location of high specific conductance could be relocated and sampled. Then step outs were performed in the creek area to reproduce a groundwater sample that was broken during the August sampling event. Step outs were performed and eventually samples were collected as described before.

2.5 Groundwater Discharge Locations

The field work identified zones of groundwater discharge. All upward potentiometric heads are highlighted in Table 1. These areas are identified in the field screening areas using the potentiometric head measurements. There were heterogeneities in some of the potentiometric head measurements. For instance, location H-7 had both upward and downward potentiometric head measurements at different depths reflecting the heterogeneities of stampsands and other buried wastes. At the majority of the locations, the stampsands were found to be highly transmissive.

Potentiometric heads were measured during field screening using the tubing from the PPS as a manometer that measures the groundwater hydraulic head relative to the surface water level. Table 1 contains field screening data that provides potentiometric head measurements. Based on these measurements, sample numbers H3, H5, H6, H11, H17, H20, H26, H29, H38, H58, H70, H201, H202, H203, H204, H205, H206, H207, H209, H210, H211, H213, H214, H215, H216, H218, H219, H220, H222, H223, H224, H225, H226, H227, H229, H235, H236, H237, H238, H239, H240, H241, H242, H243, H244, H246, H247, H249, H250, W3, W4, W11, W12, W13, W15, W20, W21, W22, W23, W24, W27, W28, W29, W30, W31, W32, W33, W34, W35, W36, W37, W38, W39, W40, W41, W43, W44, W45, W46, W48, W51, W52, W54, W65, W69, W70, W72, W73, W78, and W80 are groundwater discharge locations.

2.6 Analytical Results and Discussion

This field work was conducted to evaluate data associated with exposure pathways identified during the U.S. EPA August 2007 emergency removal action. The investigation focused on sampling in areas where agency staff and citizen reports of blue water discharging onto the Lake Linden beach and into the creek adjacent to the beach.

The MDEQ identified several areas of preferential flow. The most significant of these groundwater discharge locations are where the field screening data coincide with upward hydraulic gradients. Sample locations were biased to these locations. Field screening data, especially specific conductance and temperature measurements, were used to identify where to collect samples.

Metal transport in surface water groundwater interface is controlled by advective groundwater flow based on hydraulic head differentials, and by redox reactions that affect the partitioning of various elements between mobile and immobile phases. Therefore, the MDEQ spent time identifying the redox conditions at each of the screening locations.

The H217 sample location exhibited a large amount of gas bubbles. The field sampler was unable to measure hydraulic head because of this. There was a hard layer present with silt and sediments.

Table 1 contains the field sample data that provides the pH measurements. The pH field screening data measurements varied across the site ranging from acidic to basic. Acidic pH samples are H50 (5.7), W4 (6.97), W13 (6.75), W14 (6.73), W15 (6.65), W16 (6.74), W16A (6.43), W16B (6.56), W16C (6.5), W16D (6.67), W16E (6.65), W16F (6.60), W16G (6.7), W16H (6.56), W16I (6.65), W16J (6.64), W16K (6.76), W16L (6.66), W16M (6.78), W16N (6.7), W16O (6.68), W17 (6.74), W62 (6.86), H59 (6.77), H70 (6.5), H100 (6.11), H101 (6.26), H102 (6.11), H103 (6.14), H104 (6.31), H105 (6.42), H106 (6.16), H107 (6.06), H108 (6.17), H109 (6.44), H206 (6.91), H207 (6.92), H208 (6.94), H209 (6.63), H210 (6.46), H211 (6.45), H212 (6.56), H213 (6.88), H214 (6.8), H215 (6.62), H216 (6.54), H217 (6.59), H218 (6.52), H219 (6.72), H220 (6.69), H221 (6.88), H222 (6.94), H225 (6.73), H233 (6.88), H234 (6.97), H235 (6.92), H239 N(6.83), H250 N(6.97), H251 (6.67), and H252 (6.68). Basic pH field screening locations are H44 (8.02), W58 (8.21), W73 (8.26), W26 (8.32), W27 (8.21), W58 (8.21), W76 (8.08), and W73 (8.26).

Specific conductivity was a primary field parameter that was used to identify anomalies. Generally a high specific conductance was identified as measurements above 700 micro siemens.

Temperature measurements varied but generally the higher temperature measurements correlated to the more contaminated areas.

The ORP, otherwise called redox potential or Eh, is a measure of a water system's capacity to oxidize (lose electrons) or reduce (gain electrons). Reduced substances in water predominate when Eh is negative and oxidized substances predominate when Eh is positive. Low-oxygen water is known from its low Eh and high-oxygen water from its high Eh.

With no contamination present in a water sample, the ORP is a measurement of the dissolved oxygen present. A positive reading (zero to 999 mV) indicates positive oxygen balance and negative readings (zero to -999 mV) shows a lack of oxygen (biochemical oxygen demand [BOD]). Positive readings therefore indicate zero BODS.

Nitrates are known to reduce the ORP measurement. There is a correlation with acidic pH, high specific conductance, and nitrate contamination at the site. Also, alum or copper sulphate has been used to get 'blue water' in swimming pools.

Sample analytical results are provided in Tables 2 and 3. Results were compared to Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201) criteria. There are Part 201 exceedances of aluminum (Al), ammonia (NH₃), arsenic (As), iron (Fe), barium (Ba), boron (Bo), lead (Pb), manganese (Mn), nitrogen (N), chloride (Cl), phosphorus (P), zinc (Zn), nickel (Ni), vanadium (V), silver (Ag), and chromium (Cr) potentially discharging to Torch Lake.

Field sampling data exhibited much heterogeneity. The following observations were reported at multiple screening locations.

At sample location H101, the field technician reported a sheen on the purge water. Sheens were reported in several of the field screening data for H15, H20, H102, H101, and H104.

H51, H61, and H63 exhibited a significant sulfur odor.

H6, H9, H10, H13, H16, H19, H24, H49, H50, H51, H52, H208, H217, H234, H251, and H252 exhibited significant gas bubbles.

H50 was located three feet below the armoring rock surface, midway through a poor rock drainage culvert that drains into the slough area near where the Traprock River discharges. H50 had an acidic pH of 5.70 and a fairly elevated specific conductivity of 700.

At one location, H8, the PPS tubing seemed to pull air into the sediments.

A petroleum odor was reported at H71.

A high amount of fine sediment material, at times enough to clog the sampling equipment was identified at H33, H34, H35, H36, H53, H62, H64, H65 (sock), H66 (sock), H217, and H233.

No mercury was detected above the reporting limit of 0.2 parts per billion. Historical reports indicate that mercury was present in the waste stream. Mercury should be further evaluated using low level sampling techniques. There is a need to evaluate the presence of methyl mercury as a potential bioconcentrating ecological contaminant as this dissolved gas would not have been detected in any of the water samples using standard analytical techniques.

Near the location of the 2007 U.S. EPA Emergency Removal Arsenic Area, sample location W-43 had detections of benzene and 1,2-dichloroethane. Benzene exceeded the Groundwater Surface Water Interface (GSI) criteria.

The PPS locations H22, H101, H104, H209, W16E, W38, and W43 all exceeded Part 201 GSI criteria for chloride. However, H70 (Cl 620,000 ug/L) chloride concentrations exceeded the drinking water maximum contaminant level criteria by 2.5 times, probably due to its close proximity to the Lake Linden Road Traction/salt stockpile.

The agencies need to collect site specific Torch Lake surface water data (hardness, temperature, and pH) to ensure that the unionized ammonia is properly calculated.

This field work was intended to improve the understanding of the interaction between surface water and groundwater interaction in the shallow stumpsand aquifer (Lake Linden stumpsands). The data indicates that contaminated materials present in the mining wastes adjacent to Lake Linden are being transported to the surface water through shallow groundwater pathways. Generally, all the groundwater from the Lake Linden stumpsand aquifer discharges into Torch Lake.

Soil core samples and water samples were collected during this investigation. Logs for the soil cores are in Appendix C. Cores 1-6 were collected along the northwest side of the creek. Core 6 went in fairly easily but on examination we had refusal. MDEQ Superfund staff tried three different locations and at each location we experienced refusal about six to eight inches below the soil level. MDEQ staff thought this refusal was due to armoring of the creek banks for the walking bridge. The MDEQ moved to another location about 25 feet north of the failed Core 6 and collected Core 7. Core 10 was collected in an extremely fine grained, clayey portion of the Lake Linden beach southwest of the dock area. In some air photos, these clayey fine grained mill tailings can be seen in the waters near the Lake Linden beach. The GPS coordinates for Core 10 were lost when the GPS malfunctioned, as previously discussed.

Most cores with stumpsands contained very fine clayey purple colored material interspersed in the coarse stumpsands. The first core, Core 1, had some stratified material in the very tip.

The XRF sample results for the cores are located in Table 4. The sampling rationale for the locations of samples (Figure 5), for the Lake Linden area is based upon the results of the screening samples, former property uses, and visual observations during the field screening. The screening locations are outlined on Figures 3 and 4.

2.7 Former C&H Power Plant

There have been sediment and lipid bag samples collected from Torch Lake that detected the presence of PCBs. One potential upland source of this contamination to Torch Lake may be the former C&H Power Plant. The facility has water in the basement that is potentially in hydraulic communication with the lake via former process piping, etc.

Analytical samples were collected of sediment and water in the basement of the C&H Power Plant. The PCBs were found in these sediments. Analytical sample results and a table comparing these results to Part 201 are located in Appendix E.

3.0 RECOMMENDATIONS

The following are recommendations for future work at this site:

1. Research historical land usage through the evaluation of Sanborn maps and other historic information.
2. Identify historic industrial processes and associated chemical components and processes including potential byproducts.
3. Geophysics or similar noninvasive investigation techniques should be used in the former industrial buildings and at locations along the Lake Linden shoreline to identify where former industrial facility hydraulic interconnectivity exists with Torch Lake and the nature and extent of mining waste. Figure 7 provides recommendations on future potential investigations areas.
4. Establish regional specific background concentrations for groundwater and soils applicable to the site.
5. Install permanent groundwater monitoring wells in locations representative of the groundwater discharging to Torch Lake. Contaminant concentrations must be measured in wells placed in the groundwater contaminant plume or in the path of the contaminant plume at points located as close to the surface water body as feasible; where and when groundwater gradients show that the groundwater is moving toward the surface water body.
6. Collect low level mercury samples and evaluate the need to sample for methyl/ethyl mercury.
7. Select some of the XRF samples for confirmation laboratory analytical sampling.
8. Collect site specific Torch Lake surface water data.
9. Collect full scans of analytical data at areas of likely contamination discharge.
10. Request village of Lake Linden construct a covered salted stampsand storage area or relocate their salted stampsand stockpile away from the slough area of Torch Lake. MDEQ Superfund staff recommends relocating and covering the stockpile.
11. Along the western shoreline of Torch Lake, evaluate the presence underground features such as utilities. These features may be allowing for a hydraulic connection from PCI throughout this area.
12. In the vicinity of H45, the entire shoreline is being heavily eroded and should be armored with rip rap or an equivalent technology to protect the cap.

4.0 REFERENCES CITED

1. Michigan Department of Environmental Quality (MDEQ), Remediation and Redevelopment Division (RRD), Operational Memo No.1 “Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels”, Attachment #4 Technical Support Groundwater Contact Criteria.
2. MDEQ, RRD, Operational Memo No. 5 “Groundwater Surface Water Interface Criteria”, September 30, 2004.
3. MDEQ, RRD, Superfund Section, site files for Torch Lake Superfund Section.
4. United States Environmental Protection Agency (U.S. EPA) Fact Sheet <http://www.epa.gov/R5Super/npl/michigan/MID980901946.htm>
5. U.S. EPA Record of Decision, Torch Lake Site Operable Unit I and III, Houghton County, Michigan, September 1992.
6. U.S. EPA Site Update <http://www.epa.gov/region5/sites/torchlake/fs200804.htm>
7. [U.S. Department of the Interior, U.S. Geological Survey, Groundwater and Surface Water A Single Resource--USGS Circular 1139](#). Natural Processes of Groundwater and Surface Water Interaction, The Hydrologic Cycle and Interactions of Groundwater and Surface Water URL: http://pubs.usgs.gov/circ/circ1139/htdocs/natural_processes_of_ground.htm
8. Weed, Walter Harvey, The Mines Handbook: an enlargement of the Copper handbook; a manual of the mining industry of North America, Published by Stevens Copper Handbook Co., 1920, Original from the New York Public Library, Digitized April 18, 2006

Table 1
Field Screening Data

Sample #	Depth (ft.)	pH	Temp (°C)	ORP (mV)	Cond (µS/cm)	TDS (ppm)	Potentiometric Head (mm)
H-1	5	7.19	17.7	110	680	471	NM
	3	7.26	19.8	140	648	447	NM
H-2	3.5	7.43	19.9	14	586	403	NM
H-3	3	7.60	18.6	-36	633	437	2
	5	7.41	19	0	321	217	1.5
H-4	5	7.35	19.6	-12	330	224	0
	1	7.41	21.6	115	277	186	-
H-5	3	7.05	19.1	-40	662	457	0.5
	5	7.05	18.2	0	634	439	0.5
H-6	5	7.53	18.2	-47	360	245	NM
	3	7.40	18.6	-82	342	232	5
H-7	3	7.55	20.4	-82	353	240	2.5
	5	7.61	19.8	-45	226	150	-5
H-8	3	7.25	20.9	-31	404	275	0
	5	7.36	21.1	-32	301	203	-
H-9	3	7.57	20.3	-33	622	428	-2
	5	7.36	17.8	-44	618	427	0
H-10	5	7.40	19	-20	674	467	NM
H-11	5	6.95	19.5	-44	793	551	1
	3	6.87	21.5	-60	760	525	3
H-12	5	6.90	19.1	-72	549	378	0
	3	6.92	20.2	-89	530	364	-2
H-13	2.5	6.66	19.5	-112	1,298	926	-1.5
	5	6.82	18.0	-93	763	530	-1
H-14	3	6.90	20.3	-32	636	438	-1
	5	6.83	21.1	-13	526	361	1
H-15	3	6.77	20	-93	683	470	0
	5	6.83	18.3	-75	650	449	-3
H-16	5	6.84	20.3	-98	778	539	-3
	2.5	6.91	19.8	-81	559	384	0
H-17	2.5	6.86	19.8	-86	720	499	2
	5	6.91	18.9	-86	613	428	3
H-18	5	6.86	18.7	-80	626	431	0
	2.5	7.02	20	-105	586	403	0
H-19	5	6.93	19.5	-97	673	464	8
	2.5	7.01	21.3	-102	421	289	-
H-20	2.5	6.96	19.3	-68	599	412	2
	5	7.0	22.7	-76	394	266	8
H-21	4	6.98	19.7	-80	626	431	-2
H-22	5	6.91	19.3	-80	753	521	0
	2.5	6.99	19.6	-72	632	439	0
H-23	5	6.95	18.0	-67	675	467	0
	2.5	7.06	18.6	-96	625	435	2
H-24	5	6.93	18.2	NM	712	492	NM
	2.5	6.89	21.7	-86	695	478	NM
H-25	5	6.87	18.0	-86	685	473	3
	2.5	6.80	22.5	-90	381	258	0

Table 1
Field Screening Data

H-26	2.5	6.86	18.8	-77	658	455	2
	5	6.94	17.7	-74	628	434	1
H-27	5	6.92	18.3	-83	630	435	0
	2.5	6.95	19.3	-94	553	381	NM
H-28	5	7.19	17.4	-97	360	248	0
	2.5	7.39	18.4	-87	352	239	0
H-29	2.5	6.76	18.9	-84	763	530	2
	5	6.76	19.1	-98	761	528	1
H-30	2.5	7.00	19.4	-87	731	506	-1
	5	7.12	16.9	-110	620	429	0
H-31	2.5	7.42	20.1	-83	299	201	2
	5	7.36	18.9	-48	246	165	0
H-32	2.5	7.42	20.9	-33	266	178	NM
	5	7.53	17.8	-90	258	174	NM
H-33	2.5	7.29	22.0	-66	350	237	0
	5	7.29	20.8	-48	298	202	NM
H-34	2.5	7.48	21.3	-40	272	182	NM
	5	7.31	19.6	-45	203	136	0
H-35	2.5	7.02	17.8	-60	530	358	0
	5	7.21	18.6	-63	280	180	NM
H-36	5	6.97	20	-73	309	208	0
	2.5	7.05	21.7	-69	237	158	NM
H-37	1	7.48	17.5	90	176	118	0
H-38	2.5	7.53	15.3	30	352	242	2
	5	7.63	14.6	-60	317	217	6
H-39	1	7.06	20.4	68	181	121	0
H-40	5	7.12	20.6	130	742	513	0
	2.5	7.30	22.9	104	626	430	0
H-41	5	7.08	20.4	109	850	593	NM
H-42	2.5	7.23	21.7	86	857	596	0
	5	7.04	20.9	91	842	586	1
H-43	2.5	7.12	21.6	90	842	586	0
	5	7.08	20.6	96	829	577	1
H-44	5	8.02	19.6	48	233	156	+
	2.5	7.89	21.4	52	227	152	0
H-45	2.5	7.60	21.5	72	258	172	NM
	5	7.75	20.2	66	216	146	1.5
H-46	5	7.53	19.6	37	274	184	3
	2.5	7.32	20.4	54	273	183	NM
H-47	2.5	6.55	21.1	-107	420	287	0
	5	6.66	19.9	-92	384	261	1
H-48	3	6.94	20.6	-173	281	189	0
H-49	3	7.10	22.4	-192	270	180	0
H-50	3	5.70	22.4	-96	700	481	NM
H-51	2	6.10	23.8	-113	538	368	NM
H-52	5	6.8	19.1	-40	603	442	0
	2	7.14	18.0	15	549	402	5
H-53	2	7.42	20.4	-70	376	272	0
	5	7.41	22.0	-90	183	127	0

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Table 1
Field Screening Data

H-54	5	7.45	19.3	-55	457	333	0
	2	7.43	19.6	-73	438	318	0
H-55	2	7.55	20.3	-28	450	327	0
	5	7.59	19.4	3	360	260	0
H-56	2	7.66	20.4	-98	244	173	0
	5	7.67	19.4	-61	242	172	2
H-58	5	7.30	19.9	-87	361	260	2
	2.5	7.37	20.2	-98	345	248	4
H-59	5	6.77	19.1	-102	1,028	769	3
	2	6.83	19.4	-87	645	471	0
H-60	2	7.80	18.6	-36	191	136	0
	5	7.78	18.2	-111	191	137	0
H-61	2	7.69	19.1	5	299	214	0
	5	7.73	17.9	-22	190	135	0
H-62	5	7.54	22.2	-39	243	172	0
H-63	2	7.56	22.6	-30	324	232	NM
	5	7.48	19.6	-17	311	223	4
H-64	5	7.81	22.2	-52	271	191	0
H-65	2.5	7.90	21.5	-5	304	217	0
	5	7.90	20.1	-14	216	154	0
H-66	5	7.57	21	-4	436	316	0
	2.5	7.59	21.9	-61	335	241	-5
H-67	2.5	7.68	20.7	-19	356	256	0
	4	7.73	21.4	-81	320	230	6
H-68	5	7.65	18.6	51	377	273	0
	2.5	7.58	20.5	45	315	225	0
H-69	5	7.00	19.3	-32	698	513	8
	2	7.16	21.0	-92	571	417	NM
H-70	2	6.50	19.9	-80	3,028	2,461	3
	5	6.85	18.5	-62	780	576	2
H-71	2	7.14	23.3	-90	792	581	NM
H-100	5	6.46	21.1	-95	822	605	NM
	2.5	6.11	21.5	-88	1,522	1,159	NM
H-101	5	6.53	20.1	-107	1,291	971	NM
	2.5	6.26	20.9	-66	817	603	NM
H-102	5	6.56	19.5	-97	1,038	777	NM
	2.5	6.11	21.3	-44	521	379	NM
H-103	2.5	6.14	21.0	-73	933	693	NM
	5	6.77	21.3	-146	689	1,291	NM
H-104	5	6.66	18.7	-126	1,314	993	NM
	2.5	6.31	20.8	-85	623	455	NM
H-105	5	6.42	19.7	-79	1,156	867	NM
	2.5	6.50	21.2	-91	728	534	NM
H-106	5	6.50	20.7	-92	1,165	872	NM
	2.5	6.16	21.3	-59	794	584	NM
H-107	5	6.47	19.1	-82	1,015	759	NM
	2.5	6.06	21.1	-60	957	712	NM
H-108	2.5	6.17	20.5	-66	1,003	748	NM
	5	6.42	19.5	-83	743	546	NM

Table 1
Field Screening Data

H-109	3	6.50	21.6	-120	1,192	890	NM
	5	6.44	20.2	-90	750	551	NM
H-200	2.5	7.09	19.4	-117	720	489	0
H-201	2.5	7.00	21.5	-109	756	548	2
H-202	2.5	7.18	20.9	-64	537	362	1
H-203	2.5	7.13	20.6	-55	677	459	2.5
H-204	2.5	7.00	21.0	-38	700	476	1.5
H-205	2.5	7.06	22.3	-103	690	497	2.5
H-206	2.5	6.91	21.2	-107	689	497	1.5
H-207	2.5	6.92	21.3	-103	791	575	1.5
H-208	2.5	6.94	22.0	-108	827	600	NM
H-209	2.5	6.63	21.1	-107	845	616	0.5
H-210	2.5	6.46	22.7	-80	715	516	1
H-211	2.5	6.45	21.1	-99	752	544	0.5
H-212	2.5	6.56	20.6	-97	660	575	NM
H-213	2.5	6.88	21.3	-86	459	328	5
H-214	2.5	6.80	21.0	-86	546	391	4
H-215	2.5	6.62	21.0	-52	585	419	4
H-216	2.5	6.54	20.9	-91	710	513	4
H-217	2.5	6.59	21.0	-60	734	533	NM
H-218	2.5	6.52	20.6	-52	740	537	1
H-219	2.5	6.72	20.3	-78	670	484	1.5
H-220	2.5	6.69	21.2	-75	642	462	2
H-221	2.5	6.88	21.5	-91	577	415	NM
H-222	1	6.94	21.4	-91	609	438	2.5
	2.5	7.09	20.3	-97	565	405	2.5
H-223	2.5	7.09	20.0	-99	390	279	2.5
H-224	2.5	7.08	19.7	-123	551	397	1
H-225	2.5	6.73	21.0	-101	958	700	2.5
H-226	2.5	7.34	20.0	-53	647	467	4
H-227	2.5	7.45	18.9	-87	531	383	2.5
H-228	2.5	7.32	20.2	-95	548	395	NM
H-229	2.5	7.25	19.9	-87	359	256	2.5
H-232	2	7.01	21.2	-103	686	497	NM
H-233	2.5	6.88	21.0	-71	724	525	NM
H-234	2.5	6.97	21.0	-86	706	511	NM
H-235	2.5	6.92	20.7	-107	740	536	1.5
H-236	2.5	7.07	20.6	-89	517	372	0.5
H-237	2.5	7.18	20.6	-90	488	351	3
H-238	2.5	7.03	20.9	-49	460	331	3
H-239	2.5	6.83	20.2	-56	723	525	2
H-240	2.5	7.46	19.9	-58	350	250	2.5
H-241	2	7.47	20.1	-50	495	355	2.2
H-242	2.5	7.38	19.4	-44	712	516	6
H-243	2.5	7.55	19.2	-66	560	404	8
H-244	2.5	7.39	19.7	-83	611	440	1
H-245	2.5	7.28	20.2	-106	645	465	NM
	2.5	7.22	20	-88	642	464	NM
H-246	2.5	7.20	19.9	-64	614	443	6
H-247	2.5	7.17	19.6	-58	536	386	7

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Table 1
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H-249	2.5	7.24	18.9	-72	638	462	1
H-250	2.5	6.97	18.8	-48	506	364	1.2
H-251	2.5	6.67	20.6	-69	765	556	NM
H-252	2.5	6.68	20.6	-77	730	529	NM
W-1	5	7.50	17.1	41	606.9	414.0	NM
	3	7.57	18.7	62	593.3	403.4	NM
W-2	5	7.89	18.6	-77	242.3	160.6	NM
	3	7.89	19.8	-85	239.6	158.4	NM
W-3	5	7.0	19.8	-68	373.5	250.3	1
	3	7.14	20.9	-78	371.8	248.6	1
W-4	5	6.97	20.4	-103	463.4	312.5	1
	3	7.47	20.8	-100	370.10	248.0	1
W-5	5	7.92	21.4	-136	170.4	103.4	NM
	3	7.69	21.4	-121	355.9	237.3	NM
W-6	5	7.81	19.2	-109	399.4	269.1	NM
	3	7.76	20.8	-93	399.2	267.6	NM
W-7	5	7.83	19.3	-87	365.3	244.6	NM
	3	7.86	21.3	-99	361.6	241.4	NM
W-8	5	7.54	19.7	-105	456.4	308.1	NM
	3	7.65	20.7	-115	453.2	304.9	NM
W-9	5	7.77	18.8	-98	314.6	209.8	NM
	3	7.79	19.8	-93	327.6	218.2	NM
W-10	5	7.65	17.9	-90	672.1	485.2	NM
	3	7.30	19.2	-92	631.8	429.5	NM
W-11	5	7.60	19.2	-93	363.5	243.7	3
	3	7.59	20.2	-104	377.5	252.9	3
W-12	5	7.36	19.9	-85	521.1	352.5	2
	3	7.55	20.8	-102	509.4	343.8	2
W-13	5	6.74	20.8	-131	1309	912.6	0
	3	6.75	21.8	-91	629.7	426.3	0
W-14	5	6.73	21.5	-51	1056	720.8	NM
	3	6.81	21.7	-84	813.4	554.4	NM
W-15	5	6.65	21.2	-98	1361	949.2	2
	3	6.86	22.2	-88	720.0	487.7	2
W-16	5	6.74	24.5	-134	2029	1448.0	NM
	3	6.93	25.2	-130	1841	1295	25.2
W-16A	5	6.43	23.2	139	2112	1531	NM
	3	6.50	24.0	-160	2220	1608.0	NM
W-16B	4	6.56	21.7	-126	2506	1893.0	NM
	2	6.61	23.5	-167	2673	1971.0	NM
W-16C	3.5	6.57	23.7	-121	2129.0	1537.0	NM
	2.5	6.52	21.9	-119	2248.0	1641.0	NM
	1.5	6.50	22.2	-105	1946	1401	NM
W-16D	4.5	6.67	21.7	-110.0	1991.0	1436.0	NM
	3	6.67	23.11	-107	1553	1180	NM
W-16E	4.5	6.65	20.6	-130	2620.0	1947.0	NM
	3.5	6.83	21.8	-133	2062	1492	NM
	2.5	6.77	22.2	-135	1864	1335	NM

Table 1
Field Screening Data

W-16F	4	6.60	20.3	-103	2435	1793	NM
	3	6.66	22.8	-117	2278	1669	NM
	2	6.62	22.4	-99	1868	1338	NM
W-16G	4.5	6.70	20.4	-104	2104.0	1529	NM
	3.5	6.80	20.8	-126	1508	1069	NM
	2.5	6.75	21.5	-112	1188	833.2	NM
W-16H	4.5	6.69	20.7	-114	2617	1943	NM
	3.5	6.68	22.9	-117	2158	1566	NM
	2.5	6.56	21.7	-76	1877	1347	NM
W-16I	4.5	6.75	21.5	-114	2757	2057	NM
	3.5	6.65	22.2	-105	2457	1807	NM
W-16J	3.5	6.64	23.6	-78	2192	1593	NM
	2.5	6.66	21.4	-102	2166	1576	NM
	1.5	6.68	22.2	-103	1635	1162	NM
W-16K	4.5	6.79	21.0	-106	2167	1579	NM
	3.5	6.76	22.3	-109	1942	1399	NM
W-16L	3.5	6.73	21.9	-75	3007	2263	NM
	2.5	6.66	21.6	-88	2168	1578	NM
W-16M	4	6.78	22.4	-125	2951	2216	NM
	3	6.80	22.2	-135	2180	1586	NM
W-16N	4.5	6.70	22.3	-77	2709	2015	NM
	3.5	6.75	22.8	-63	1677	1193	NM
W-16O	4	6.68	22.9	-35	2327	1703	NM
	3	6.77	22.7	-69	1901	1364	NM
W-17	5	6.74	21.7	-65	1357	946.2	-3
W-18	5	7.09	21.4	-97	1024	705.6	NM
W-19	5	7.34	20.6	-96	651.5	442.0	0
	3	7.53	22.2	-78	454.3	305.1	0
W-20	5	7.21	21.1	-35	806.8	551.2	5
	3	7.28	21.8	-82	780.3	531.2	5
W-21	5	7.27	20.3	-76	881.7	605.0	1
	3	7.40	22.4	-85	763.2	518.4	1
W-22	5	7.37	21.0	-41	707.7	480.4	1
	3	7.39	22.5	-67	571.4	385.6	1
W-23	5	7.45	21.0	-49	649.4	440.1	1
	3	7.62	22.6	-55	587.1	396.2	1
W-24	5	7.71	20.8	-12	535.5	361.4	1
	3	7.70	22.1	-4	514.4	387.8	1
W-25	5	7.66	20.9	5	275.8	181.5	0
	3	7.51	22.6	-44	245.9	161.5	0
W-26	5	8.16	22.8	0.0	272.8	178.4	0
	3	8.32	24.8	3.0	239.0	156.5	0
W-27	5	8.21	22.1	16	204.1	134.2	1
	3	8.09	23.4	15	210.4	138.0	1
W-28	5	7.47	21.5	49	543.4	366.4	2
	3	7.40	22.8	47	522.5	351.7	2
W-29	5	7.41	20.9	47	853.7	584.3	1
	3	7.44	22.3	47	699.5	473.8	1
W-30	5	7.21	21.2	32	785.0	534.7	1
	3	7.30	22.7	5	801.2	545.1	1

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Table 1
Field Screening Data

W-31	5	7.26	21.1	20	662.4	448.6	2
	3	7.38	22.6	42	638.7	431.6	2
W-32	5	6.50	21.0	132	851.4	587.8	2
	3	6.80	21.8	100	709.2	485.1	2
W-33	5	7.20	20.1	54	1063	742.2	2
	3	7.44	21.3	25	1111	776.4	2
W-34	5	6.97	20.1	41	879.7	609.4	5
	3	7.24	21.4	32	1000	495.5	5
W-35	5	7.36	19.9	48	800.8	552.2	2
	3	7.39	21.4	41	806.4	555.2	2
W-36	5	7.49	19.8	29	878.5	608.9	1
	3	7.48	21.4	30	868.2	599.9	1
W-37	5	6.98	19.9	55	808.6	557.7	2
	3	7.17	21.1	46	806.2	555.5	2
W-38	5	7.03	20.2	52	982.3	683.9	1
	3	7.03	21.1	49	970.1	674.0	1
W-39	5	7.04	20.4	22	811.4	559.7	2
	3	7.07	21.2	55	882.4	610.4	2
W-40	5	7.12	19.9	63	724.7	497.5	4
	3	7.11	21.2	53	627.6	428.8	4
W-41	5	7.75	19.6	32	818.5	564.1	2
	3	6.80	21.7	-77	829.7	571.6	2
W-42	5	6.69	22.2	-68	510.1	343.4	NM
	3	6.85	24.1	-73	746.5	510.3	NM
W-43	5	6.56	20.4	-77	757.9	520.8	1.5
	3	6.55	22.9	-94	802.8	551.3	1.5
W-44	3	6.48	21.5	-87	691.6	472.9	3
	1.5	6.48	22.0	-91	575.9	392.2	3
W-45	3	6.61	21.1	-43	663.3	453.6	0.75
	1.5	6.91	25.4	-70	382.0	254.6	0.75
W-46	4	6.71	21.0	-104	802.0	551.6	0.75
	2	6.81	21.5	-114	849.1	585.6	0.75
W-47	5	7.19	21.8	-59	726.1	488.6	NM
	3	7.24	20.4	-93	743.8	500.3	NM
W-48	5	7.24	22.5	-111	671.3	450.4	5
	3	7.22	23.8	-106	677.3	455.8	5
W-49	4	7.19	22.8	36	654.4	440.0	NM
	2	7.13	23.5	75	294.3	192.4	NM
W-50	4.3	7.19	21.7	-96	245.3	434.6	NM
	2.3	7.17	22.8	-103	699.1	471.0	NM
W-51	5	7.25	20.8	-66	602.3	405.7	10
	3.5	7.28	20.7	-76	624.4	420.7	10
	1.25	7.45	22.9	91	651.5	438.1	10
W-52	5	7.36	20.7	140	741.5	503.2	2
	3	7.38	21.8	102	779.7	528.4	2
W-53	5	7.48	20.3	122	623.1	420.8	NM
	3	7.50	21.5	104	599.0	403.4	NM
W-54	5	7.55	20.2	83	595.0	401.6	1.5
	3	7.62	21.1	94	595.9	401.3	1.5

Table 1
Field Screening Data

W-55	5	7.10	20.5	117	1018	699.7	NM
	3	7.11	21.3	102	1021	701.7	NM
W-56	5	7.19	21.6	91	839.3	570.6	NM
	3	7.34	22.4	92	833.1	565.9	NM
W-57	5	7.68	21.1	120	633.2	427.1	NM
	3	7.63	22.4	106	656.1	442.2	NM
W-58	5	8.21	21.8	121	209.4	137.3	NM
	3	8.18	23.1	97	210.8	137.8	NM
W-59	5	7.80	21.7	82	257.0	168.1	NM
	3	7.84	22.4	93	302.1	198.6	NM
W-60	5	7.39	21.2	105	280.4	183.8	NM
	3	7.65	22.7	124	284.5	186.3	NM
W-61	5	7.14	21.0	-96	300.8	198.1	NM
	3	7.28	21.6	-117	325.0	214.7	NM
W-62	3.5	6.88	22.5	-95	471.6	315.6	0
	2.5	6.86	23.4	-144	636.4	427.7	0
W-63	5	6.72	21.6	-81	603.7	407.1	0
	3	7.04	21.9	-101.0	649.5	437.3	0
W-64	4	7.45	20.1	-131.0	529.9	356.5	0
	2	7.45	20.3	-132	510.4	343.7	0
W-65	5	6.43	18.5	-84.0	625.7	429.0	2
	3	7.39	19.2	-94	256.1	170.4	2
W-66	4	7.00	19.5	-88	371.0	250.3	NM
	2	7.41	20.1	-103	288.2	192.2	NM
W-67	5	6.91	19.6	-59	456.9	310.3	0
	3	7.16	20.4	-97	428.0	290.2	0
W-68	4	7.15	19.9	-75	566.1	386.4	NM
	2	7.47	20.9	-101	564.2	384.8	NM
W-69	5	7.30	20.5	-52.0	250.0	166.0	1
	3	7.39	21.1	-77	263.7	174.7	1
W-70	5	7.30	20.5	-59	448.4	304.2	3
	3	7.30	21.1	-78	429.0	290.5	3
W-71	5	6.81	19.6	-97	360.2	242.9	0
	3	6.69	20.4	-95	414.0	280.4	0
W-72	5	7.88	18.5	-133	191.9	127.7	2
	3	7.73	19.6	-61	227.7	152.1	2
W-73	4	8.18	18.9	-27	172.3	113.9	3
	2	8.26	20.1	-20	164.1	108.0	3
W-74	5	7.64	19.7	-65	347.0	233.2	0
	3	7.54	21.2	-93	366.1	246.4	0
W-75	5	7.61	20.4	-75	266.8	178.4	-2
	3	7.78	22.2	-77	186.4	119.1	-2
W-76	5	8.04	19.6	0.0	328.3	220.7	0
	3	8.08	21.1	0.0	335.5	225.9	0
W-77	5	7.61	20.4	-82	372.2	251.5	0
	3	7.69	22.12	-94	322.4	216.6	0
W-78	4	7.30	19.7	52	702.4	481.8	1
	2	7.33	20.4	38	697.3	477.8	1
W-79	4	7.12	19.8	-61	733.9	504.2	0
	2	7.63	20.3	-89	344.4	331.7	0
W-80	4	7.54	19.5	-73	313.8	210.4	4

NM = Not Measured

Lake Linden GIS Investigation

August 4-8, 2008

Table 1
Field Screening Data

	2	7.60	20.8	-85	373.0	251.5	4
BW-Creek A	0	10.7	6.82	-35	210	150	NM
	4	11.3	6.16	-58	687	500	NM
	2	11.2	6.28	-62	892	657	NM
	3	11.6	6.37	-75	792	580	NM
BW-Creek B	3.5	11.9	6.37	-71	777	568	NM
	4.5	11.8	6.25	-73	642	467	NM
	2.5	12.0	6.47	-80	765	560	NM
BW-Creek C	3.5	12.0	6.59	-84	735	536	NM
	4.5	11.7	6.62	-87	693	505	NM
	2.5	12.0	6.64	-92	729	531	NM
BW-Creek D	4	11.9	6.67	-86	754	551	NM
	3	12.0	6.70	-93	745	544	NM
	5	11.8	6.59	-93	685	500	NM
	2	12.1	6.73	-98	747	545	NM
BW-Creek E	5	13	7.07	-39	698	479	NM
	3.5	13.3	7.07	-62	686	470	NM
BW-Creek F	3	11.6	6.60	-74	727	530	NM
	5	11.8	6.69	-97	708	515	NM
BW-Creek G	3.5	12.5	7.08	-87	1,041	727	NM
	5.5	12.8	7.15	-94	692	474	NM
BW-Creek H	4.9	12.8	7.22	-108	662	454	NM
	3	12.8	7.08	-141	878	609	NM
BW-Creek I	2.5	11.6	6.71	-90	749	547	NM
	4.5	11.7	6.70	-105	683	497	NM
BW-Creek J	3	12.7	7.06	-105	1,184	833	NM
	5	12.6	7.23	-117	729	501	NM
BW-Creek K	3	12.0	6.7	-97	724	528	NM
	4	11.7	6.8	-194	710	517	NM
BW-Creek L	2.8	12.5	7.11	-105	1,034	722	NM
	3.3	12.8	7.11	-105	992	692	NM
	5.2	12.6	7.21	-111	680	467	NM
BW-Creek M	2	11.6	6.72	-96	740	539	NM
	3.5	11.8	6.77	-103	704	512	NM
BW-Creek N	2	12.4	7.01	-95	1,223	860	NM
	2.5	12.2	7.03	-99	1,273	896	NM
	4	12.4	7.23	-101	696	477	NM
BW-Creek O	2	12.3	7.0	-73	1,044	730	NM
	4	12.0	7.27	-104	626	429	NM
BW-Creek P	3	12.3	6.76	-101	789	578	NM
	5	12.2	6.70	-101	686	500	NM
BW-Creek Q	3	13.1	7.07	-92	1,118	783	NM
	2	13.2	7.15	-95	1,118	783	NM
	5.5	13	7.24	-109	584	399	NM
BW-Creek R	4	12.0	6.67	-101	708	515	NM
	3	11.8	6.73	-106	715	520	NM

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
BRIDGE 1, Collected: 8/8/2008-20:40				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	170	T	ug/L	50	50	NA		6.4E+7
Arsenic	17	T	ug/L	10	10	150	50	4,300
Barium (B)	530	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	390	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	41	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	8,300	T	ug/L	300	300	NA		5.8E+7
Lead (B)	4.7	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	4.2	T	ug/L	100	100	29		7.4E+7
Zinc (B)	12	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	2,600	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	190	T	ug/L			53		
Nitrogen	3,100	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Phosphorus, Total	270	T	ug/L	63,000	240,000	1,000		ID
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	5.2	T	ug/L	10	10	150	50	4,300
Barium (B)	760	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	330	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	1.6	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	6,300	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	770	T	ug/L	50	50	1,000	1,000	9.1E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	UNITS					
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Nickel (B)	2.8	T	ug/L	100	100	29		7.4E+7
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	7.7	T	ug/L	10	10	150	50	4,300
Barium (B)	18,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	540	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	5	T	ug/L	100	100	11		460,000
Copper (B)	3.9	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	50,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	1.1	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,600	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	22	T	ug/L	100	100	29		7.4E+7
Selenium (B)	1.1	T	ug/L	50	50	5		970,000
Zinc (B)	15	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	22,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,600	T	ug/L			53		
Nitrogen	23,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	60,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,500	T	ug/L	63,000	240,000	1,000		ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	30	T	ug/L	10	10	150	50	4,300

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
Barium (B)	22,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	580	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	7	T	ug/L	100	100	11		460,000
Copper (B)	9.3	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	37,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	14	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,000	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	39	T	ug/L	100	100	29		7.4E+7
Selenium (B)	1	T	ug/L	50	50	5		970,000
Zinc (B)	83	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	18,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,300	T	ug/L			53		
Nitrogen	20,000	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	55,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,200	T	ug/L	63,000	240,000	1,000		ID
Sulfate	20,000	T	ug/L	250,000	250,000	NA		ID
<i>Volatiles</i>								
Chlorobenzene (l)	1.5	T	ug/L	100	100	47		86,000
1,4-Dichlorobenzene	1.6	T	ug/L	75	75	13		6,400
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Arsenic	34	T	ug/L	10	10	150	50	4,300
Barium (B)	710	T	ug/L	2,000	2,000	210	210	1.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
Boron (B)	1,200	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	8	T	ug/L	100	100	11		460,000
Copper (B)	1.2	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	20,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,800	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	3.7	T	ug/L	100	100	29		7.4E+7
Zinc (B)	11	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	7,800	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	560	T	ug/L			53		
Nitrogen	8,200	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	35,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	680	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
H-2, Collected: 8/6/2008-13:30				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	24,000	T	ug/L	50	50	NA		6.4E+7
Arsenic	7.7	T	ug/L	10	10	150	50	4,300
Barium (B)	120	T	ug/L	2,000	2,000	210	210	1.4E+7
Beryllium	1.1	T	ug/L	4	4	0.41		290,000
Boron (B)	110	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	0.28	T	ug/L	5	5	1.3	1.3	190,000
Chromium (with Cr VI criteria)	37	T	ug/L	100	100	11		460,000
Cobalt	20	T	ug/L	40	100	100		2.4E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-2, Collected: 8/6/2008-13:30				ug/L	ug/L	ug/L	ug/L	ug/L
Copper (B)	2,300	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	13,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	48	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	510	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	54	T	ug/L	100	100	29		7.4E+7
Silver (B)	7.5	T	ug/L	34	98	0.2		1.5E+6
Vanadium	82	T	ug/L	4.5	62	12		970,000
Zinc (B)	150	T	ug/L	2,400	5,000	66		1.1E+8
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Antimony	1.5	T	ug/L	6	6	130	2	68,000
Arsenic	83	T	ug/L	10	10	150	50	4,300
Barium (B)	16,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	680	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	17	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	26,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	27	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	14	T	ug/L	100	100	29		7.4E+7
Zinc (B)	120	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	7,700	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	550	T	ug/L			53		
Nitrogen	8,600	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening Levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	55,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,400	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	6,100	T	ug/L	50	50	NA		6.4E+7
Arsenic	49	T	ug/L	10	10	150	50	4,300
Barium (B)	1,200	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	360	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	7	T	ug/L	100	100	11		460,000
Copper (B)	3,800	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	15,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	22	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,900	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	22	T	ug/L	100	100	29		7.4E+7
Silver (B)	4.3	T	ug/L	34	98	0.2		1.5E+6
Vanadium	30	T	ug/L	4.5	62	12		970,000
Zinc (B)	52	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	1,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	79	T	ug/L			53		
Nitrogen	1,300	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	52,000	T	ug/L	250,000	250,000	50,000	50,000	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	T					
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
Phosphorus, Total	170	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
H-225, Collected: 8/8/2008-08:48				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	12	T	ug/L	10	10	150	50	4,300
Barium (B)	2,600	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	980	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	13	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	6,500	T	ug/L	300	300	NA		5.8E+7
Lead (B)	6.4	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,900	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	4.4	T	ug/L	100	100	29		7.4E+7
Nitrogen Forms								
Ammonia	1,400	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	100	T	ug/L			53		
Nitrogen	1,800	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	22,000	T	ug/L	250,000	250,000	NA		ID
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	7.8	T	ug/L	10	10	150	50	4,300
Barium (B)	380	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	240	T	ug/L	500	500	1,900		6.2E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
Copper (B)	9.7	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	2,500	T	ug/L	300	300	NA		5.8E+7
Lead (B)	1	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	410	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia	3,600	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	260	T	ug/L			53		
Nitrogen	4,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	40,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	350	T	ug/L	63,000	240,000	1,000		ID
Sulfate	3,000	T	ug/L	250,000	250,000	NA		ID
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	28	T	ug/L	10	10	150	50	4,300
Barium (B)	310	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	770	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	2	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	14,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	690	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	3	T	ug/L	100	100	29		7.4E+7
Nitrogen Forms								
Ammonia	1,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	79	T	ug/L			53		
Nitrogen	1,100	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening Levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	T					
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	21,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	140	T	ug/L	63,000	240,000	1,000		ID
Sulfate	3,000	T	ug/L	250,000	250,000	NA		ID
H-59, Collected: 8/8/2008-16:07				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	52	T	ug/L	50	50	NA		6.4E+7
Arsenic	15	T	ug/L	10	10	150	50	4,300
Barium (B)	430	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	630	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	5	T	ug/L	100	100	11		460,000
Copper (B)	54	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	15,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,600	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	3	T	ug/L	100	100	29		7.4E+7
<i>Nitrogen Forms</i>								
Ammonia	8,900	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	640	T	ug/L			53		
Nitrogen	9,500	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	30,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,000	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening Levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-70, Collected: 8/8/2008-19:30				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	3	T	ug/L	10	10	150	50	4,300
Barium (B)	590	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	140	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	16	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	17,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	860	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	5.6	T	ug/L	100	100	29		7.4E+7
Nitrogen Forms								
Ammonia	1,200	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	86	T	ug/L			53		
Nitrogen	1,700	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	620,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Sulfate	25,000	T	ug/L	250,000	250,000	NA		ID
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	96	T	ug/L	50	50	NA		6.4E+7
Arsenic	2.5	T	ug/L	10	10	150	50	4,300
Barium (B)	11,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	600	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	5	T	ug/L	100	100	11		460,000
Copper (B)	5.3	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	81,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	3,700	T	ug/L	50	50	1,000	1,000	9.1E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Nickel (B)	15	T	ug/L	100	100	29		7.4E+7
Selenium (B)	3.4	T	ug/L	50	50	5		970,000
<i>Nitrogen Forms</i>								
Ammonia	72,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	5,200	T	ug/L			53		
Nitrogen	76,000	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	56,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	2,000	T	ug/L	63,000	240,000	1,000		ID
Sulfate	22,000	T	ug/L	250,000	250,000	NA		ID
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Antimony	1.4	T	ug/L	6	6	130	2	68,000
Arsenic	44	T	ug/L	10	10	150	50	4,300
Barium (B)	28,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	690	T	ug/L	500	500	1,900		6.2E+7
Chromium VI	7	T	ug/L	100	100	11		460,000
Copper (B)	64	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	54,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	21	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	12	T	ug/L	170	350	96		5.4E+6
Manganese (B)	3,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	34	T	ug/L	100	100	29		7.4E+7
Selenium (B)	1.8	T	ug/L	50	50	5		970,000
Zinc (B)	63	T	ug/L	2,400	5,000	66		1.1E+8

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nitrogen Forms</i>								
Ammonia	80,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	5,800	T	ug/L			53		
Nitrogen	83,000	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	2,400	T	ug/L	63,000	240,000	1,000		ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Antimony	2.1	T	ug/L	6	6	130	2	68,000
Arsenic	25	T	ug/L	10	10	150	50	4,300
Barium (B)	750	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	750	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	780	T	ug/L	1,000	1,000	5		7.4E+6
Lead (B)	5.2	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	480	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	4.2	T	ug/L	100	100	29		7.4E+7
Silver (B)	0.22	T	ug/L	34	98	0.2		1.5E+6
Vanadium	4.4	T	ug/L	4.5	62	12		970,000
Zinc (B)	12	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	64,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	4,600	T	ug/L			53		
Nitrogen	67,000	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	UNITS					
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Sulfate	6,000	T	ug/L	250,000	250,000	NA		ID
W-38, Collected: 8/7/2008-17:42				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Arsenic	2.6	T	ug/L	10	10	150	50	4,300
Barium (B)	710	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	160	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	0.95	T	ug/L	5	5	1.3	1.3	190,000
Copper (B)	440	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	47	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	4.1	T	ug/L	100	100	29		7.4E+7
Silver (B)	0.42	T	ug/L	34	98	0.2		1.5E+6
Vanadium	3.6	T	ug/L	4.5	62	12		970,000
Zinc (B)	26	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	4,500	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	320	T	ug/L			53		
Nitrogen	4,900	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	80,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	8,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	48	T	ug/L	10	10	150	50	4,300
Barium (B)	350	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	58	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	29	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	39,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	730	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	2.3	T	ug/L	100	100	29		7.4E+7
Nitrogen Forms								
Ammonia	17,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,200	T	ug/L			53		
Nitrogen	18,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	67,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	150	T	ug/L	63,000	240,000	1,000		ID
Sulfate	43,000	T	ug/L	250,000	250,000	NA		ID
Volatiles								
Benzene (l)	11	T	ug/L	5	5	200	12	11,000
1,2-Dichloroethane (l)	4.1	T	ug/L	5	5	360	6	19,000
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	64	T	ug/L	50	50	NA		6.4E+7
Barium (B)	740	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	1,400	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	230	T	ug/L	1,000	1,000	5		7.4E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Iron (B)	56	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	490	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	4.4	T	ug/L	100	100	29		7.4E+7
Silver (B)	0.21	T	ug/L	34	98	0.2		1.5E+6
Vanadium	2.5	T	ug/L	4.5	62	12		970,000
Nitrogen Forms								
Ammonia	8,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	580	T	ug/L			53		
Nitrogen	8,500	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	49,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
W-72, Collected: 8/8/2008-00:00				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	88	T	ug/L	50	50	NA		6.4E+7
Arsenic	5.1	T	ug/L	10	10	150	50	4,300
Barium (B)	170	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	52	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	74	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	71	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	27	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia	430	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	31	T	ug/L			53		
Nitrogen	670	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-72, Collected: 8/8/2008-00:00				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	2,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID
W-73, Collected: 8/8/2008-17:00				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Arsenic	2.8	T	ug/L	10	10	150	50	4,300
Barium (B)	89	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	45	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	35	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	20	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	39	T	ug/L	50	50	1,000	1,000	9.1E+6
<i>Nitrogen Forms</i>								
Ammonia	510	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	37	T	ug/L			53		
Nitrogen	560	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	3,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	10	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID
W-76, Collected: 8/8/2008-17:40				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	830	T	ug/L	50	50	NA		6.4E+7
Arsenic	10	T	ug/L	10	10	150	50	4,300
Barium (B)	17,000	T	ug/L	2,000	2,000	210	210	1.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-76, Collected: 8/8/2008-17:40				ug/L	ug/L	ug/L	ug/L	ug/L
Boron (B)	86	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	2.5	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	5	T	ug/L	100	100	11		460,000
Copper (B)	13,000	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	11,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	1.1	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	12,000	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	150	T	ug/L	100	100	29		7.4E+7
Zinc (B)	47	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	1,300	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	94	T	ug/L			53		
Nitrogen	3,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	4,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID
W-78, Collected: 8/8/2008-18:26				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	73	T	ug/L	50	50	NA		6.4E+7
Arsenic	2.1	T	ug/L	10	10	150	50	4,300
Barium (B)	230	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	440	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	110	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	79	T	ug/L	300	300	NA		5.8E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening Levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-78, Collected: 8/8/2008-18:26				ug/L	ug/L	ug/L	ug/L	ug/L
Manganese (B)	570	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	3.7	T	ug/L	100	100	29		7.4E+7
Silver (B)	0.39	T	ug/L	34	98	0.2		1.5E+6
<i>Nitrogen Forms</i>								
Ammonia	3,300	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	240	T	ug/L			53		
Nitrogen	3,500	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	8,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	70	T	ug/L	63,000	240,000	1,000		ID
Sulfate	24,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III, IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					

Red shaded (color printer) or dark shaded (black-white printer) results indicate the result exceeded at least one criteria.

Blue shaded cells on color printers or criterion with (1) on black-white printers indicate the criterion was exceeded.

Yellow shaded cells on color printers or criterion with (2) on black-white printers indicate the reporting limit was above the criteria highlighted.

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and footnote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

When more than one method is used to analyze for a parameter then each result will be shown in the reports.

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
BRIDGE 1, Collected: 8/8/2008-20:40				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	170	T	ug/L	50	50	NA		6.4E+7
Arsenic	17	T	ug/L	10	10	150	50	4,300
Barium (B)	530	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	41	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	8,300	T	ug/L	300	300	NA		5.8E+7
Lead (B)	4.7	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	190	T	ug/L			53		
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Barium (B)	760	T	ug/L	2,000	2,000	210	210	1.4E+7
Iron (B)	6,300	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	770	T	ug/L	50	50	1,000	1,000	9.1E+6
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Barium (B)	18,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	540	T	ug/L	500	500	1,900		6.2E+7
Iron (B)	50,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,600	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia	22,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,600	T	ug/L			53		
Nitrogen	23,000	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	60,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,500	T	ug/L	63,000	240,000	1,000		ID
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Arsenic	30	T	ug/L	10	10	150	50	4,300
Barium (B)	22,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	580	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	9.3	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	37,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	14	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,000	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	39	T	ug/L	100	100	29		7.4E+7
Zinc (B)	83	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	18,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,300	T	ug/L			53		
Nitrogen	20,000	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	55,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,200	T	ug/L	63,000	240,000	1,000		ID
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Arsenic	34	T	ug/L	10	10	150	50	4,300
Barium (B)	710	T	ug/L	2,000	2,000	210	210	1.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
Boron (B)	1,200	T	ug/L	500	500	1,900		6.2E+7
Iron (B)	20,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,800	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	560	T	ug/L			53		
H-2, Collected: 8/6/2008-13:30				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	24,000	T	ug/L	50	50	NA		6.4E+7
Beryllium	1.1	T	ug/L	4	4	0.41		290,000
Chromium (with Cr VI criteria)	37	T	ug/L	100	100	11		460,000
Copper (B)	2,300	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	13,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	48	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	510	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	54	T	ug/L	100	100	29		7.4E+7
Silver (B)	7.5	T	ug/L	34	98	0.2		1.5E+6
Vanadium	82	T	ug/L	4.5	62	12		970,000
Zinc (B)	150	T	ug/L	2,400	5,000	66		1.1E+8
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	83	T	ug/L	10	10	150	50	4,300
Barium (B)	16,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	680	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	17	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	26,000	T	ug/L	300	300	NA		5.8E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Lead (B)	27	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Zinc (B)	120	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	550	T	ug/L			53		
Nonspecific Grouping								
Chloride	55,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,400	T	ug/L	63,000	240,000	1,000		ID
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	6,100	T	ug/L	50	50	NA		6.4E+7
Arsenic	49	T	ug/L	10	10	150	50	4,300
Barium (B)	1,200	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	3,800	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	15,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	22	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,900	T	ug/L	50	50	1,000	1,000	9.1E+6
Silver (B)	4.3	T	ug/L	34	98	0.2		1.5E+6
Vanadium	30	T	ug/L	4.5	62	12		970,000
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	79	T	ug/L			53		
Nonspecific Grouping								
Chloride	52,000	T	ug/L	250,000	250,000	50,000	50,000	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-225, Collected: 8/8/2008-08:48				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	12	T	ug/L	10	10	150	50	4,300
Barium (B)	2,600	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	980	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	13	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	6,500	T	ug/L	300	300	NA		5.8E+7
Lead (B)	6.4	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	1,900	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	100	T	ug/L			53		
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Barium (B)	380	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	9.7	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	2,500	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	410	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	260	T	ug/L			53		
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	28	T	ug/L	10	10	150	50	4,300
Barium (B)	310	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	770	T	ug/L	500	500	1,900		6.2E+7
Iron (B)	14,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	690	T	ug/L	50	50	1,000	1,000	9.1E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nitrogen Forms</i>								
Ammonia, Unionized, Warm Bo	79	T	ug/L			53		
H-59, Collected: 8/8/2008-16:07				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	52	T	ug/L	50	50	NA		6.4E+7
Arsenic	15	T	ug/L	10	10	150	50	4,300
Barium (B)	430	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	630	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	54	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	15,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	1,600	T	ug/L	50	50	1,000	1,000	9.1E+6
<i>Nitrogen Forms</i>								
Ammonia, Unionized, Warm Bo	640	T	ug/L			53		
H-70, Collected: 8/8/2008-19:30				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Barium (B)	590	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	16	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	17,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	860	T	ug/L	50	50	1,000	1,000	9.1E+6
<i>Nitrogen Forms</i>								
Ammonia, Unionized, Warm Bo	86	T	ug/L			53		
<i>Nonspecific Grouping</i>								
Chloride	620,000	T	ug/L	250,000	250,000	50,000	50,000	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	96	T	ug/L	50	50	NA		6.4E+7
Barium (B)	11,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	600	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	5.3	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	81,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	3,700	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia	72,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	5,200	T	ug/L			53		
Nitrogen	76,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	56,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	2,000	T	ug/L	63,000	240,000	1,000		ID
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	44	T	ug/L	10	10	150	50	4,300
Barium (B)	28,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	690	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	64	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	54,000	T	ug/L	300	300	NA		5.8E+7
Lead (B)	21	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	3,100	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	34	T	ug/L	100	100	29		7.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nitrogen Forms</i>								
Ammonia	80,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	5,800	T	ug/L			53		
Nitrogen	83,000	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Phosphorus, Total	2,400	T	ug/L	63,000	240,000	1,000		ID
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Antimony	2.1	T	ug/L	6	6	130	2	68,000
Arsenic	25	T	ug/L	10	10	150	50	4,300
Barium (B)	750	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	750	T	ug/L	500	500	1,900		6.2E+7
Copper (B)	780	T	ug/L	1,000	1,000	5		7.4E+6
Lead (B)	5.2	T	ug/L	4	4	4.8	4.8	ID
Manganese (B)	480	T	ug/L	50	50	1,000	1,000	9.1E+6
Silver (B)	0.22	T	ug/L	34	98	0.2		1.5E+6
<i>Nitrogen Forms</i>								
Ammonia	64,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	4,600	T	ug/L			53		
Nitrogen	67,000	T	ug/L	10,000	10,000			
W-38, Collected: 8/7/2008-17:42				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Barium (B)	710	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	440	T	ug/L	1,000	1,000	5		7.4E+6
Manganese (B)	1,100	T	ug/L	50	50	1,000	1,000	9.1E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-38, Collected: 8/7/2008-17:42				ug/L	ug/L	ug/L	ug/L	ug/L
Silver (B)	0.42	T	ug/L	34	98	0.2		1.5E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	320	T	ug/L			53		
Nonspecific Grouping								
Chloride	80,000	T	ug/L	250,000	250,000	50,000	50,000	ID
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Arsenic	48	T	ug/L	10	10	150	50	4,300
Barium (B)	350	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	29	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	39,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	730	T	ug/L	50	50	1,000	1,000	9.1E+6
Nitrogen Forms								
Ammonia	17,000	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bo	1,200	T	ug/L			53		
Nitrogen	18,000	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	67,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Volatiles								
Benzene (l)	11	T	ug/L	5	5	200	12	11,000
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	64	T	ug/L	50	50	NA		6.4E+7
Barium (B)	740	T	ug/L	2,000	2,000	210	210	1.4E+7
Boron (B)	1,400	T	ug/L	500	500	1,900		6.2E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	RESULTS					
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Copper (B)	230	T	ug/L	1,000	1,000	5		7.4E+6
Manganese (B)	490	T	ug/L	50	50	1,000	1,000	9.1E+6
Silver (B)	0.21	T	ug/L	34	98	0.2		1.5E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	580	T	ug/L			53		
W-72, Collected: 8/8/2008-00:00				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	88	T	ug/L	50	50	NA		6.4E+7
Copper (B)	74	T	ug/L	1,000	1,000	5		7.4E+6
W-73, Collected: 8/8/2008-17:00				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Copper (B)	35	T	ug/L	1,000	1,000	5		7.4E+6
W-76, Collected: 8/8/2008-17:40				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	830	T	ug/L	50	50	NA		6.4E+7
Barium (B)	17,000	T	ug/L	2,000	2,000	210	210	1.4E+7
Cadmium (B)	2.5	T	ug/L	5	5	1.3	1.3	190,000
Copper (B)	13,000	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	11,000	T	ug/L	300	300	NA		5.8E+7
Manganese (B)	12,000	T	ug/L	50	50	1,000	1,000	9.1E+6
Nickel (B)	150	T	ug/L	100	100	29		7.4E+7
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	94	T	ug/L			53		

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-78, Collected: 8/8/2008-18:26				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	73	T	ug/L	50	50	NA		6.4E+7
Barium (B)	230	T	ug/L	2,000	2,000	210	210	1.4E+7
Copper (B)	110	T	ug/L	1,000	1,000	5		7.4E+6
Manganese (B)	570	T	ug/L	50	50	1,000	1,000	9.1E+6
Silver (B)	0.39	T	ug/L	34	98	0.2		1.5E+6
Nitrogen Forms								
Ammonia, Unionized, Warm Bo	240	T	ug/L			53		

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 Analytical Detections Greater than Criteria

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III, IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					

Red shaded (color printer) or dark shaded (black-white printer) results indicate the result exceeded at least one criteria.

Blue shaded cells on color printers or criterion with (1) on black-white printers indicate the criterion was exceeded.

Yellow shaded cells on color printers or criterion with (2) on black-white printers indicate the reporting limit was above the criteria highlighted.

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and footnote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

When more than one method is used to analyze for a parameter then each result will be shown in the reports.

Table 4
XRF Sample Results

Sample	Metal piece	Metal piece	Metal piece	H225 3"	H225 13"	H225 26"	H225 34"	H209 3"	H209 14"	H50 2"	H50 9"	H50 21"
Sampling Mode	In-situ	In-situ	In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ
Analyte												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	48.69	ND	8.35	ND
Barium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	ND	ND	ND	7410.44	15745.73	9704.87	28672.24	4056.11	7064.93	21063.23	20633.21	17748.03
Cesium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND	ND	ND	ND	69.92	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	243.03	ND
Copper	7.53	0.329	29.806	443.17	523.18	1999.83	782.83	322.64	2673.61	523.91	569.18	754.7
Iron	30.149	7.309	5.836	13722.01	15754.97	21882.92	28010.16	9879.46	14316.62	29255.96	20887.91	28457.53
Lead	0.04	ND	0.01	ND	20.98	32.97	37.97	10.21	948.93	12.61	ND	15.06
Manganese	0.304	ND	0.123	177.1	183.09	328.64	348.84	143.91	201.02	410.13	302.08	441.3
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	ND	ND	ND	15986.26	25254.31	36340.84	15377.28	13098.46	10932.45	14258.85	19925.1	17788.69
Rubidium	ND	ND	ND	46.97	55.16	78.75	36.69	41.56	35.23	39.84	46.05	42.22
Scandium	ND	ND	ND	ND	ND	ND	ND	25.29	ND	ND	ND	45.16
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.002	ND	0.016	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strontium	NA	NA	NA	79.66	71.34	48.7	86.5	55.01	65.34	83.58	73.14	86.06
Sulfur	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tellurium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thorium	ND	ND	ND	10.37	11.41	25.27	12.58	ND	ND	ND	12.95	ND
Tin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Titanium	ND	ND	ND	1821.95	2342.75	1869.24	3509.24	1359.77	2379.64	3072.24	2763.26	3263.67
Tungsten	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Uranium	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	86.05	ND	ND	136.62	< 64.90	ND	ND	ND	114.45
Zircon	ND	ND		237.34	285.11	275.05	282.74	156.56	197.27	283.93	280.52	365.04
Zinc	0.128	0.043	0.043	ND	34.22	72.56	47.65	19.94	251.44	36.46	34.18	55.19
Bromine	ND	ND	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	W43 6"	W43 14"	W43 18"	W43 22"	W43 30"	Core 1 2"	Core 1 6"	Core 1 14"	Core 1 24"	Core 2 2"	Core 2 7"	Core 2 14"
Sampling Mode	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ
Analyte												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	22	11.3	294.38	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	564.11	ND	ND	ND	ND	ND	ND	378.09
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	9986.34	13027.99	13926.68	18356.77	21599.08	2721.91	3519.85	7172.26	2923.13	2448.13	1885.33	3814.73
Cesium	ND	ND	ND	ND	63.81	ND	ND	ND	ND	ND	ND	ND
Chromium	ND	43.24	78.89	ND	ND	55.09	36.55	ND	ND	ND	ND	46.25
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	1358.1	938.25	5971.2	2765.95	2855.07	198.71	284.76	2743.27	266.55	294.43	105.22	521.6
Iron	32185.31	19031.57	23262.32	21636.3	28336.03	7710.53	7742.98	19677.83	7174.03	3256.4	8099.31	11323.69
Lead	22.06	35.65	619.75	11.69	17.04	18.68	111.71	50.6	49.85	41.91	26.14	36.13
Manganese	397.77	274.18	276.52	281.28	393.66	157.76	123.97	274.62	126.61	< 56.36	91.46	141.42
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	14035.46	8966.68	5864.96	19106.14	12572.97	6349.25	8664.31	16976.2	10614.08	3889.98	12133.86	10401.33
Rubidium	49.50	38.40	23.93	41.82	33.75	32.01	33.46	68.00	37.11	8.39	36.46	36.91
Scandium	37.59	68.95	64.72	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strontium	80.83	65.11	59.26	99.09	103.45	26.81	70.69	58.31	37.08	14.05	30.77	45.37
Sulfur	ND	ND	21862.46	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tellurium	ND	ND	ND	ND	77.99	ND	ND	ND	ND	ND	ND	ND
Thorium	12.69	13.03	ND	10.37	ND	ND	ND	11.66	ND	ND	ND	ND
Tin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Titanium	2915.22	2113.12	2886.45	2707.36	3733.02	1941.18	2079.07	2579.83	1625.42	1217.94	1705.09	2059.56
Tungsten	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Uranium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	110.91	ND	107.49	93.1	124.71	ND	ND	80.35	ND	ND	ND	81.32
Zircon	433.56	298.15	185.86	354.06	312.72	152.21	152.21	313.59	136.85	50.25	212.19	169.04
Zinc	85.86	51.39	332.34	48.04	41.06	31.88	46.83	36.4	46.23	13.13	20.61	43.07
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	Core 2 20"	Core 3 1"	Core 3 6"	Core 3 13"	Core 3 19"	Core 3 25"	Core 4 2"	Core 5 4"	Core 7 1"	Core 7 4"	Core 8 4"	Core 8 14"
Sampling Mode	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ
Analyte												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	106.75
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	156.86
Barium	ND	ND	416.24	ND	ND	ND	ND	ND	ND	ND	ND	9030.3
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66.80
Calcium	15382.51	3903.18	2309.03	3370.69	13585.99	5405.45	5193.81	2570.24	6267.78	3080.98	1015.29	19604.43
Cesium	ND	ND	29.83	ND	ND	ND	ND	ND	ND	ND	ND	95.7
Chromium	ND	ND	25.6	47.31	ND	ND	ND	ND	ND	66.43	ND	161.53
Cobalt	175.58	ND	ND	ND	ND	ND	128.46	ND	ND	ND	ND	ND
Copper	2423.5	395.49	184.57	169.95	1418.09	453.86	210.65	323.99	178.14	148.22	33.85	18129.74
Iron	19282.08	5897.23	6936.7	8894.82	19642.17	12184.57	8871.19	23556.39	5698.01	10473.61	3926.78	25558.38
Lead	130.32	11.04	11.04	34.57	85.07	151.92	17.22	26.14	14.56	18.57	14.42	11102.03
Manganese	218.89	157.99	106.57	148.34	289.32	161.01	142.37	308.4	90.38	202.88	< 66.91	680.65
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	9.25	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	23625.86	4131.93	9409.75	14329.05	21441.86	14701.49	2650.64	26716.9	2931.87	16536.04	12918.4	19977.31
Rubidium	58.22	10.50	30.41	40.63	53.69	38.79	5.87	118.03	13.12	56.13	38.22	48.68
Scandium	45.92	ND	ND	ND	ND	ND	45.07	ND	28.21	ND	ND	54.95
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	84.92
Strontium	49.61	28.3	28.48	42.23	69.51	49.86	23.83	49.9	24.33	54.71	29	300.67
Sulfur	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	51925.41
Tellurium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thorium	21.92	ND	ND	ND	15.16	ND	ND	ND	ND	ND	ND	87.16
Tin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3003.42
Titanium	2568.43	897.73	1229.96	2184.51	3154.07	2559.07	1637.79	2831.62	1339.93	1894.43	947.72	3499.69
Tungsten	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	149.8
Uranium	ND	ND	ND	ND	ND	10.81	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zircon	343.18	128.26	105.94	193.97	277.89	136.6	52.35	946.81	69.78	154.35	110.3	236.69
Zinc	57.36	ND	ND	17.67	54.63	55.5	41.48	ND	20.01	22.43	ND	1247.85
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	Core 8A 3"	Core 8A 6"	Core 8A 10"	Core 8A 15"	Core 8A 20"	Core 8A 28"	W16 2"	W16 6"	W16 11"	W16 16"	W16 20"	W16 23"
Sampling Mode	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ
Analyte												
Antimony	ND	ND	ND	28.72	ND	ND	ND	ND	83.42	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	16.81	ND	ND	103.83	ND	ND	ND
Barium	ND	ND	ND	5853.27	ND	ND	991.14	2951.23	6734.4	ND	ND	ND
Cadmium	ND	ND	ND	37.34	ND	ND	ND	11.62	49.80	ND	ND	ND
Calcium	1328.44	2960.43	2822.96	27529.34	5466.64	5526.12	2159.02	5510.82	16978.93	2038.37	7535.87	2896.34
Cesium	ND	ND	ND	ND	ND	ND	ND	16.18	102.99	ND	ND	ND
Chromium	35.77	ND	ND	112.72	ND	ND	ND	40.9	142.29	ND	ND	ND
Cobalt	ND	ND	ND	233.27	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ND	100.21	550.36	11266.85	223.27	464.82	41.87	1940.02	11660.75	232.31	2069.32	233.91
Iron	4919.74	9536.14	8104.41	17647.25	5788.34	12965.62	5407.81	12372.37	21155.18	7279.94	21531.87	8556.91
Lead	9.24	57.21	310.83	6954.55	119	132.38	17	1917.48	7873.66	28.77	30.46	17.9
Manganese	113.74	164.4	193.12	416.93	82.2	207.2	78.7	203.92	556.2	132.5	278.64	119.12
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	69.53	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	17.81	ND	ND	ND
Potassium	11209.28	24239.97	15806.02	14174.95	6420.01	10446.33	9302.43	20841.22	19730.61	9493.7	19267.38	10754.92
Rubidium	27.58	65.46	54.59	38.72	22.71	33.79	33.84	51.13	52.52	37.23	48.51	36.27
Scandium	ND	ND	ND	ND	ND	ND	ND	ND	55.42	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	42.98	ND	ND	ND	16.82	63.57	ND	ND	ND
Strontium	21.46	50.31	47.01	189.22	37.75	39.91	30.03	89.15	209.36	27.44	45.04	34.02
Sulfur	ND	ND	ND	38004.75	17644.41	ND	ND	ND	52788.77	ND	ND	ND
Tellurium	ND	ND	ND	ND	ND	ND	ND	ND	131.27	ND	ND	ND
Thorium	ND	ND	ND	55.31	ND	10.64	ND	28.37	57.91	ND	16.04	ND
Tin	ND	ND	ND	1960.65	ND	ND	ND	836.34	2067.91	ND	ND	ND
Titanium	1113.79	2138.23	2492.98	3101.04	1290.49	2568.49	967.77	3203.66	3966.26	1093.1	3310.81	1408.26
Tungsten	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Uranium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	92.21	ND	ND	107.68	ND	ND	ND	ND
Zircon	92.93	238.21	219.71	212.01	135.24	234.61	140.35	244.71	194.22	141.66	245.92	158.23
Zinc	ND	24.17	47.95	720.32	64.01	50.61	17.52	178.98	861.71	ND	32.25	25.96
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	W16 27"	W16 30"	H2 4"	H2 12"	H2 18"	H2 22"	H2 32"	Core 10 2"	Core 10 8"	Core 10 18"	Core 11 10"	Core 11 28"
Sampling Mode	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ	Core In-situ
Analyte												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	11.3	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	3732.83	3351.96	13836.82	29028.64	29303.08	21811.43	17709.07	35165.61	25366.05	25168.5	11970.65	17575.63
Cesium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	55.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	338.94	366.62	880.09	653.73	675.27	622.22	673.93	1914.83	2351.84	2628.91	1135.11	1636.28
Iron	10761.39	11485	26825.24	22167.75	24818.93	24752.35	25972.86	38655.23	26458.36	33842.84	16052.7	25051.18
Lead	92.93	135.21	16.43	ND	ND	18.09	19	22.64	12.76	16.64	ND	ND
Manganese	160.34	182.62	330.48	459.73	339.22	344.72	284.7	571.8	328.2	425.99	274.27	218.18
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	78.61	ND	ND	ND	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	10515.43	8407.82	19199.58	17458.7	14554.8	14004.77	18285.42	10269.42	20995.13	16628.46	17706.46	18935.78
Rubidium	39.84	31.69	50.96	40.32	32.80	36.99	52.47	29.57	37.37	35.40	44.92	42.73
Scandium	ND	ND	ND	ND	73.93	ND	ND	94.91	64.66	ND	ND	54.67
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strontium	36.61	38.67	116.65	92.41	97.97	99.72	111.99	109.3	77.98	97.29	126.64	129.09
Sulfur	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tellurium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thorium	ND	ND	15.68	ND	ND	10.99	17.16	12.55	9.71	13.73	17.44	ND
Tin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Titanium	2039.85	2237.04	2683.96	3284.88	3567.88	3174.85	3059.56	4391.92	3883.07	4739.26	2027.32	3073.14
Tungsten	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Uranium	ND	13.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	112.78	122.89	102.29		131.76	108.81	115.15	ND	ND
Zircon	271.69	242.22	477.55	286.28	283.47	327.25	450.91	295.36	289.29	361.53	390.48	454.54
Zinc	33.89	41.95	40.39	44.6	62.94	65.96	48.51	ND	66.98	36.05	38.87	24.9
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	CB1	CB2	W16	W16	Lake Linden Beach - Dark	Lake Linden S. of Dock	Lake Linden SE Sludge	Lake Linden SE Sludge	Lake Linden SE Sludge	CB1	CB2	W16
Sampling Mode	Bag	Bag	Bag	Bag	Bag	Bag	Bag	Bag	Bag	Cup	Cup	Cup
Analyte												
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	981.57	2100.53	64.44	ND	ND	ND	ND	ND	ND	1461.8	3317.66	ND
Barium	500.72	325.5	478.36	576.72	274.93	256.3	ND	ND	ND	1172.2	849.73	1017.43
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	7660.25	6158.24	3689.44	4334.41	19594.99	8479.76	21558.39	10343.27	25754.67	14977.51	10404.93	7389.5
Cesium	ND	ND	26.99	ND	ND	ND	ND	ND	ND	64.51	79.72	36.32
Chromium	375.59	310.37	ND	60.32	47.13	94.91	ND	ND	ND	498.19	458.82	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	116142.6	290744.1	832.49	669.75	2328.82	943.48	125.61	61.08	57.29	172581.7	520339.8	1146.55
Iron	36549.46	27952.03	11635.14	11293.01	32217.22	24100.71	7596.41	11458.95	2579.77	58388.27	51577.02	17626.39
Lead	438.62	201.85	376.96	428.06	ND	ND	10.24	16.46	10.59	573.6	284.2	670.59
Manganese	218.46	291.98	159.55	183.86	478.59	298.76	103.54	106.92		407.29	430.49	288.32
Molybdenum	15.35	ND	ND	ND	ND	ND	7.33	17.41	21.87	8.93	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	337.39	878.31	1365.02	ND	ND	ND
Palladium	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.98	ND	ND
Potassium	6173.7	3556.17	15317.5	10278.1	12572.74	5687.76	3847.85	2178.25	2860.7	14935.39	9994.9	40405.5
Rubidium	60.76	37.11	49.06	38.47	30.23	38.88	ND	ND	ND	67.08	54.57	66.68
Scandium	40.66	33.72	ND	ND	61.93	45.62	94.73	76.63	ND	16.26	13.49	16.56
Selenium	48.75	ND	ND	ND	ND	ND	ND	ND	ND	60.69	38.11	ND
Silver	56.12	39.59	ND	ND	ND	ND	ND	ND	ND	108.76	74.41	ND
Strontium	789.12	421.14	28.68	42.63	79.98	87.76	17.67	8.84	6.49	1236.9	639.78	54.14
Sulfur	28242.04	29081.02	ND	ND	ND	ND	ND	ND	ND	140821.2	188439.1	17604.71
Tellurium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	93.70	44.62
Thorium	41.36	ND	ND	ND	10.34	10.56	ND	ND	ND	40.74	22.59	19.47
Tin	ND	ND	34.42	69.37	ND	ND	ND	ND	ND	47.34	78.64	174.31
Titanium	6573.98	3500.41	2645.46	2739.36	4230.31	2245.78	2294.39	518.2	994.64	10994.04	6965.89	4674.77
Tungsten	391.27	553.49	ND	ND	ND	ND	ND	ND	ND	408.14	ND	ND
Uranium	ND	ND	ND	ND	ND	ND	ND	8.17	6.93		ND	12.64
Vanadium	206.22	125.54	122.7	113.21	144.07	107.9	91.98	ND	ND	254.78	181.26	
Zircon	190.98	65.81	153.27	245.34	266.65	356.28	29.18	20.43	29.44	253.92	62.16	261.03
Zinc	675.16	ND	81.51	67.98	52.6	38.31	ND	19.21	36.61	738.29	ND	98.59
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	Lake Linden Beach - Dark	Lake Linden S. of Dock	Lake Linden SE Sludge	Core 1 0.45-0.58'	Core 2 1.06-1.32'	Core 8 1.05-1.35'	Core 8A 1.35-1.51'	Core 10 0.00-0.44'	Core 11 1.00-1.25'	W16 0.73-1.05'	W16 2.15-2.83'	H2 0.00-0.12'
Sampling Mode	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup
Analyte												
Antimony	ND	26.81	ND	ND	ND	170.11	171.2	14.69	ND	122.71	ND	13.57
Arsenic	10.14	8.05	ND	5.44	ND	398.77	567.51	11.53	ND	207.9	13.95	ND
Barium	529.15	822.83	ND	218.12	718.88	12692.58	13870.17	562.04	674.26	9658.68	435.8	784.23
Cadmium	ND	ND	ND	ND	ND	74.12	90.67	ND	ND	61.27	ND	ND
Calcium	51162.18	40606.91	50899.8	7597.2	7791.68	34278.91	32485.81	57627.13	44614.61	25796.53	13086.53	57495.29
Cesium	40.19	80.05	ND	ND	39.89	103.69	136.72	66.07	48.83	99.61	ND	64.66
Chromium	37.71	ND	ND	ND	ND	119.86	122.86	ND	ND	86.79	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	3249.45	1583.43	311.62	274.3	498.05	25974.01	28980.35	2533.4	1729.8	17025.17	819.47	1180.61
Iron	50851.02	42560.86	26275.58	11354.98	15272.33	39828.91	39172.32	63267.04	35041.11	33110.25	28475.2	42304.94
Lead	12.23	14.21	11.54	46.77	114.04	15383.63	16288.95	9.5	12.34	10351.93	238.2	24.56
Manganese	789.75	522.52	411.92	159.14	240.79	1030.71	1227.91	935.68	446.02	845.82	401.4	543.84
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	54.06	70.58	459.07	< 24.09	ND	98.14	118.58	97.33	37.19	69.88	ND	58.74
Palladium	ND	ND	ND	ND	ND	15.6	ND	ND	ND	12.94	ND	ND
Potassium	32049.8	36760.52	14748.44	25627.81	28446.19	34612.47	32254.11	19904.06	38228.59	34603.25	36838.99	34722.23
Rubidium	42.32	53.59	12.57	43.29	48.01	71.90	63.21	27.77	57.82	68.44	64.62	50.85
Scandium	27.91	36.28	27.59	15.32	15.98	23.68	23.68	43.3	36.79	20.69	21.14	42.93
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ND	5.98	ND	ND	ND	118.89	130.63	ND	ND	85.06	ND	ND
Strontium	128.91	131.75	52.42	64.81	53.38	421.53	392.67	124.99	178.86	307.8	73.2	129.39
Sulfur	ND	ND	ND	ND	12922.77	186842.3	186419.7	ND	ND	141471.4	30477.29	16957.14
Tellurium	ND	86.64	ND	ND	38.7	165.36	246.4	92.89	ND	179.71	ND	70.79
Thorium	12.67	14.87	ND	4.09	7.41	214.15	228.1	10.62	18.17	145.55	11.72	16.01
Tin	14.39	33.50	ND	ND	25.06	4100.26	4294.96	23.95	12.64	2826.99	46.42	28.03
Titanium	7386.98	6408.38	7000.27	2747.49	5703.26	5835.37	5847.26	7384.97	6208.4	5145.06	6397.91	7119.61
Tungsten	ND	ND	ND	ND	ND	161.13	236.91	ND	ND	93.63	ND	ND
Uranium	7.86	7.43	ND	ND	8.12	11.17	16.74	8.13	9.09	9.39	13.56	8.40
Vanadium	164.7	147.94	153.11	44.64	ND	ND	ND	140.32	170.15	ND	120.51	181.25
Zircon	381.2	530.42	103.99	152.18	326.24	279.07	295.1	294.68	565.94	331.53	403.19	498.94
Zinc	74.34	61.11	43.67	39.55	43.55	1743.3	1940.4	53.89	50.06	1204.23	89.63	69.69
Bromine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Non-Detect

Table 4
XRF Sample Results

Sample	H43 1.40'-1.67'	H50 0.64'-0.97'	H209 1.00'-1.25'	H225 1.0'-1.2'	Lake Linden SE Sludge
Sampling Mode	Cup	Cup	Cup	Cup	Cup
Analyte					
Antimony	ND	ND	29.23	ND	ND
Arsenic	176.08	ND	131.51	6.03	ND
Barium	568.52	748.21	1386.42	658.27	ND
Cadmium	ND	ND	7.90	ND	ND
Calcium	36874	49088.65	19764.5	50554.59	21743.22
Cesium	26.65	73.96	56.41	45.47	ND
Chromium	45.82	31.26	34.18	ND	199.29
Cobalt	ND	ND	ND	ND	ND
Copper	8936.99	755.62	4431.51	701.26	26.26
Iron	56601.44	47634.97	30424.87	31535	2040.33
Lead	995.69	19.19	1933.07	46.21	10.63
Manganese	687.67	615.62	424.82	476.36	ND
Molybdenum	ND	ND	ND	ND	21.56
Nickel	88.82	65.11	52.96	50.31	1500.07
Palladium	ND	ND	10.71	ND	ND
Potassium	21981.76	36125.04	31364.43	43115.73	3856.8
Rubidium	42.49	51.24	57.89	57.15	ND
Scandium	23.66	39.7	25.52	38.79	27.13
Selenium	ND	ND	ND	ND	ND
Silver	16.75	ND	15.06	6.06	ND
Strontium	119.51	114.08	95.09	119.58	6.21
Sulfur	94224.38	ND	89999.31	11914.19	6247.3
Tellurium	ND	80.69	74.82	ND	ND
Thorium	41.51	15.6	41.09	17.04	ND
Tin	249.56	29.73	349.76	18.53	ND
Titanium	7100.94	6964.68	6487.66	5220.63	942.22
Tungsten	ND	ND	ND	ND	ND
Uranium	11.07	8.40	9.75	7.95	5.45
Vanadium	130.63	177.41	93.75	109.04	53.57
Zircon	385.43	440.36	313.98	420.3	21.82
Zinc	350.51	55.9	390.12	79.21	37.22
Bromine	ND	ND	ND	ND	ND

ND = Non-Detect

Table 5
Low-Flow Sampling Field Parameters

Sample #	Comments	Time	pH	Temp	ORP	Cond	TDS
H-101 5'	Begin purge @ 9:45; Odor, old decaying sediments; Sheen on purge H2O; DO Field Test = 0.02; Light foam floating on sample H2O; Sample @ 10:07	9:48	6.54	20.1	-124	NM	NM
		9:53	6.57	20.1	-98	NM	NM
		9:58	6.55	20.2	-100	1404	980
		10:03	6.63	19.9	-100	1404	981
		10:07	6.66	20.1	-107	1402	979
H-104 5'	Begin purge @ 10:40; Foam & sheen on purge H2O; Tiny bubbles generating in VOA sample; Sample @ 11:27	10:40	6.95	20.7	-111	1629	1150
		10:43	6.96	21.4	-129	1554	1092
		10:46	6.91	21.4	-117	1509	1058
		10:50	6.88	21.8	-122	1481	1035
		11:00	6.80	22.2	-117	1438	1001
		11:05	6.84	22.0	-115	1426	993
		11:10	6.84	21.2	-110	1417	988
		11:17	6.94	21.4	-105	1403	976
H-209	DO = 0.16 ppm; Fe++ = 4.35 * 5 = 21.15 ppm; Sample @ 9:18	NM	6.55	21.5	-157	854	622
		NM	6.63	21.3	-114	834	607
		9:18	6.67	21.3	-108	822	597
		NM	6.67	21.6	-102	821	597
		NM	6.72	22.4	-104	827	601
H-50	DO = 0.02 PPM; Fe++ = 5 * 2.60 = 13.00 ppm; Sample @ 11:45	NM	5.82	19.7	-59	659	475
		NM	5.96	20.6	-57	629	456
		NM	5.81	20.8	-62	628	418
W-16L	Begin purge @ 8:57; Many small gas bubbles; H2O effervesces like 7-UP; Light yellow tinge; Changes to light brown; DO = 0.07 mg/L; Sample @ 9:25	9:05	6.59	21.1	-60	2502	1834
		9:09	6.69	20.7	-131	2461	1801
		9:14	6.69	20.3	-138	2448	1793
		9:19	6.70	20.3	-141	2440	1785
		9:24	6.70	20.4	-139	2436	1783
W-16E	Begin purge @ 9:47; Many small bubbles; Light yellow tinge; DO = 0.07 mg/L; Thin sheen on H2O; Sample @ 10:03	9:52	6.66	20.7	-99	2579	1897
		9:57	6.64	21.1	-128	2576	1895
		NM	6.65	21.0	-129	2577	1897
W-43 3'	Begin purge @ 10:57 @ 5' then pulled up to 3' @ 11:14; Water clear @ 3' and purple @ 5'; All GB samples H2O turns light blue; Sample @ 11:25	11:02	6.68	19.1	-111	736.1	501.5
		11:14	6.62	20.3	-85	771.7	527.4
		11:19	6.60	20.3	-87	766.8	523.9
		11:24	6.61	20.3	-87	770.0	526.2

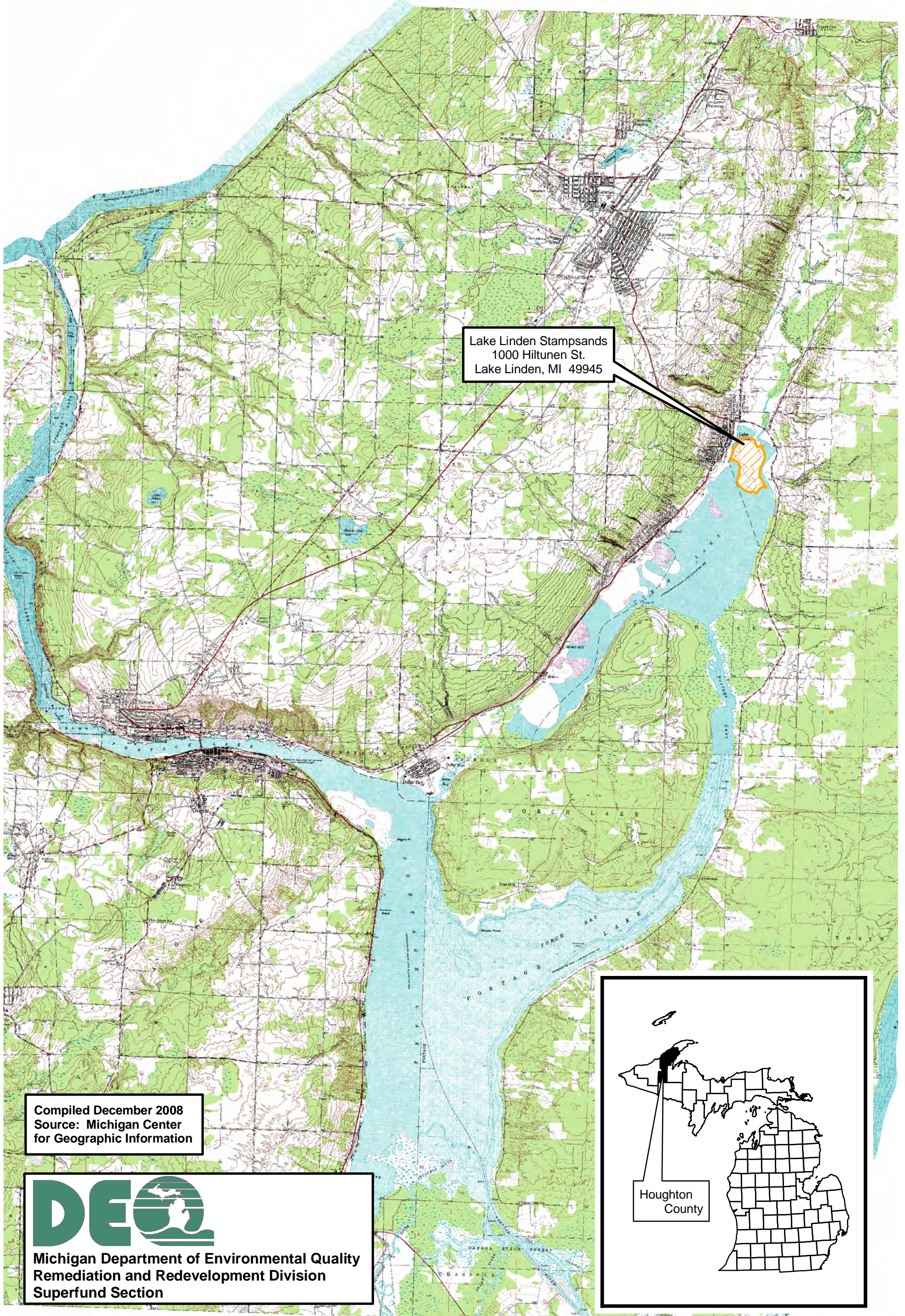
Table 5
Low-Flow Sampling Field Parameters

Sample #	Comments	Time	pH	Temp	ORP	Cond	TDS
W-33	Begin purge @ 12:32; H2O is clear; pulled up probe between 2nd & 3rd readings; Sample @ 13:02	12:36	7.13	22.9	-98	1067	737.2
		12:41	7.21	23.0	-74	1067	737.3
		12:46	7.24	22.9	-45	1077	743.8
		12:51	7.25	22.7	-32	1079	746.2
		12:56	7.25	22.6	-23	1081	747.2
		13:01	7.25	22.7	-17	1080	747.0
H-29	Begin purge @ 14:34; Sample @ 15:16	14:44	7.15	17.7	21	432.7	292.1
		14:49	7.11	16.9	-43	422.7	286.5
		14:55	7.2	17.3	-49	425.8	288.3
		15:00	7.23	17.0	-77	434.0	294.4
		15:05	7.24	17.1	-86	441.5	299.6
		15:10	7.25	16.9	-88	443.1	300.8
		15:15	7.25	17.3	-95	446.7	303.0
H-22	Begin purge @ 14:22; Spitting out blackish/purple/red H2O; Joe cleaned out line @ 14:50; Pump is hardly producing H2O, first mud, then H2O is light purple/brown. Sample @ 16:03	15:56	7.11	25.1	-70	712.3	480.7
		16:01	7.11	24.8	-90	715.3	483.4
H-16 5'	Begin purge @ 15:50; Water clear with thin metal sheen on water that breaks up when penetrated; 2.5 gallons purged; flow rate 225-250 ml/min; sample @ 16:56	16:08	6.89	19.2	-87	616.3	418.9
		16:13	6.85	19.2	-101	624.8	424.6
		16:18	6.83	19.2	-109	628.2	427.0
		16:23	6.82	19.1	-107	629.7	428.0
		16:30	6.83	19.1	-94	630.5	428.7
W-38 5'	Begin purge @ 17:26; Clear H2O; 1.5 gallons purged; Sample @ 17:42	17:31	6.97	22.9	-39	869.5	594.8
		17:36	7.03	22.8	-36	870.9	595.7
		17:41	7.01	22.8	-28	873.5	597.8
H-22	Begin purge @ 8:38; H2O cleared up fast, 1st cond was 1302; DO = 0.09 mg/L; H2O looked light rusty red, iron precip? Sample @ 8:48	8:47	6.99	21.5	-95	1169	786.6
		8:53	7.02	21.5	-105	1084	727.1
W-55	Begin purge @ 11:25; 1.75 gallons purged; H2O clear with sand at first; purplish bubbles came out of lake bottom when probe pulled out; Sample @ 11:46	11:31	6.51	22.4	192	974.1	646.0
		11:33	6.84	22.1	59	946.0	629.1
		11:36	6.85	22.0	35	942.0	627.0
		11:38	7.00	22.2	20	940.0	625.0
		11:40	7.05	22.2	14	940.7	625.5
		11:42	7.05	22.2	6	938.5	624.1
H-59	Begin purge @ 15:54; 4 gallons purged; H2O clear, turns rusty in bucket; Sample @ 16:07	15:58	6.71	19.4	-13	679.0	458.7
		16:00	6.72	19.0	-67	697.6	460.0
		16:02	6.74	18.9	-90	696.0	459.2
		16:04	6.75	19.0	-97	784.2	464.4
		16:52	7.86	18.4	-36	170.0	108.0

Table 5
Low-Flow Sampling Field Parameters

Sample #	Comments	Time	pH	Temp	ORP	Cond	TDS
W-73	Begin purge @ 16:50; Red/purple fine sand coming out; clear H2O; 1 gallon purged; Sample @ 17:00	16:54	8.02	18.5	-43	163.0	104.0
		16:56	8.07	18.3	-49	162.0	103.0
		16:58	8.07	18.5	-51	162.0	103.0
W-76	Begin purge @ 17:13 45' away from well decide to move closer; Re-start purge @ 17:25; Muddy chocolate brown water/mud; H2O will not clear up, syill muddy; Sample @ 17:40	17:35	7.77	25.0	-21	177.0	111.0
		17:37	7.96	25.0	-30	179.0	113.0
		17:39	7.95	24.7	-30	186.0	117.0
W-78 4'	Begin purge @ 18:21; Sample @ 18:26; Use (2) 250 ml plastic bottles for MN instead of (1) 500 ml plastic bottle	18:24	7.20	18.2	33	599	395
		18:25	7.08	18.1	31	598	395
H-70	Purge w/ portable drill pump; By stamp sand salt pile, hard layer @ 6" feels about 2" thick & quite hard to probe through; Sample @ 19:30; Use 250ml plastics instead of 500ml	19:26	6.88	16.3	-80	2317	1643
		19:28	6.90	16.1	-84	2291	1622

Figure 1
Property Location
Lake Linden Stampsands/Torch Lake Superfund Site



Compiled December 2008
Source: Michigan Center
for Geographic Information



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

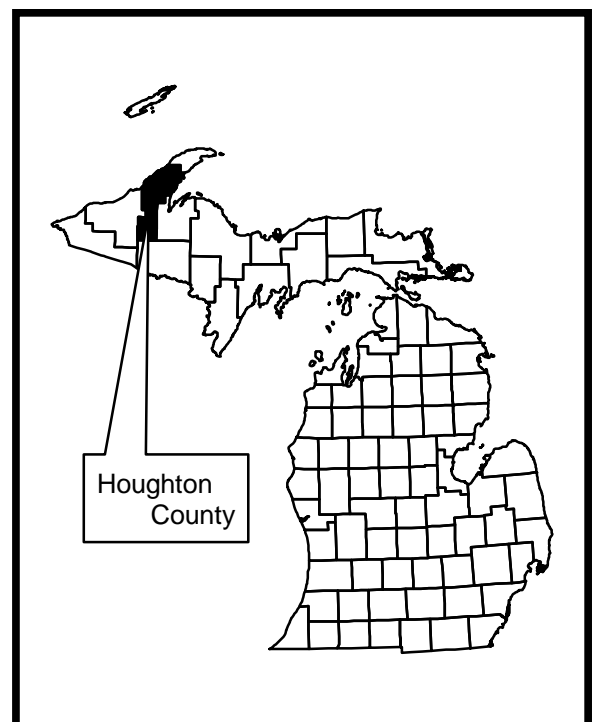


Figure 2
Site Features
Lake Linden Stampsands/Torch Lake Superfund Site



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

0 250 500 1,000 Feet

Compiled December 2008
Source: Michigan Center
for Geographic Information
2005 Aerial Photograph

Figure 3 Lake Linden Stampsands High Resolution Screening Locations Torch Lake Superfund Site



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

0 75 150 300 Feet

Compiled December 2008
Source: Michigan Center
for Geographic Information
2005 Aerial Photograph and
Global Positioning System Data

Figure 4
Lake Linden Stampsands Groundwater Screening Locations
Torch Lake Superfund Site



0 200 400 Feet



Michigan Department of Environmental Quality
 Remediation and Redevelopment Division
 Superfund Section

Compiled December 2008
 Source: Michigan Center
 for Geographic Information
 2005 Aerial Photograph and
 Global Positioning System Data

Figure 5
Lake Linden Stampsands Groundwater Sampling Locations
Torch Lake Superfund Site



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

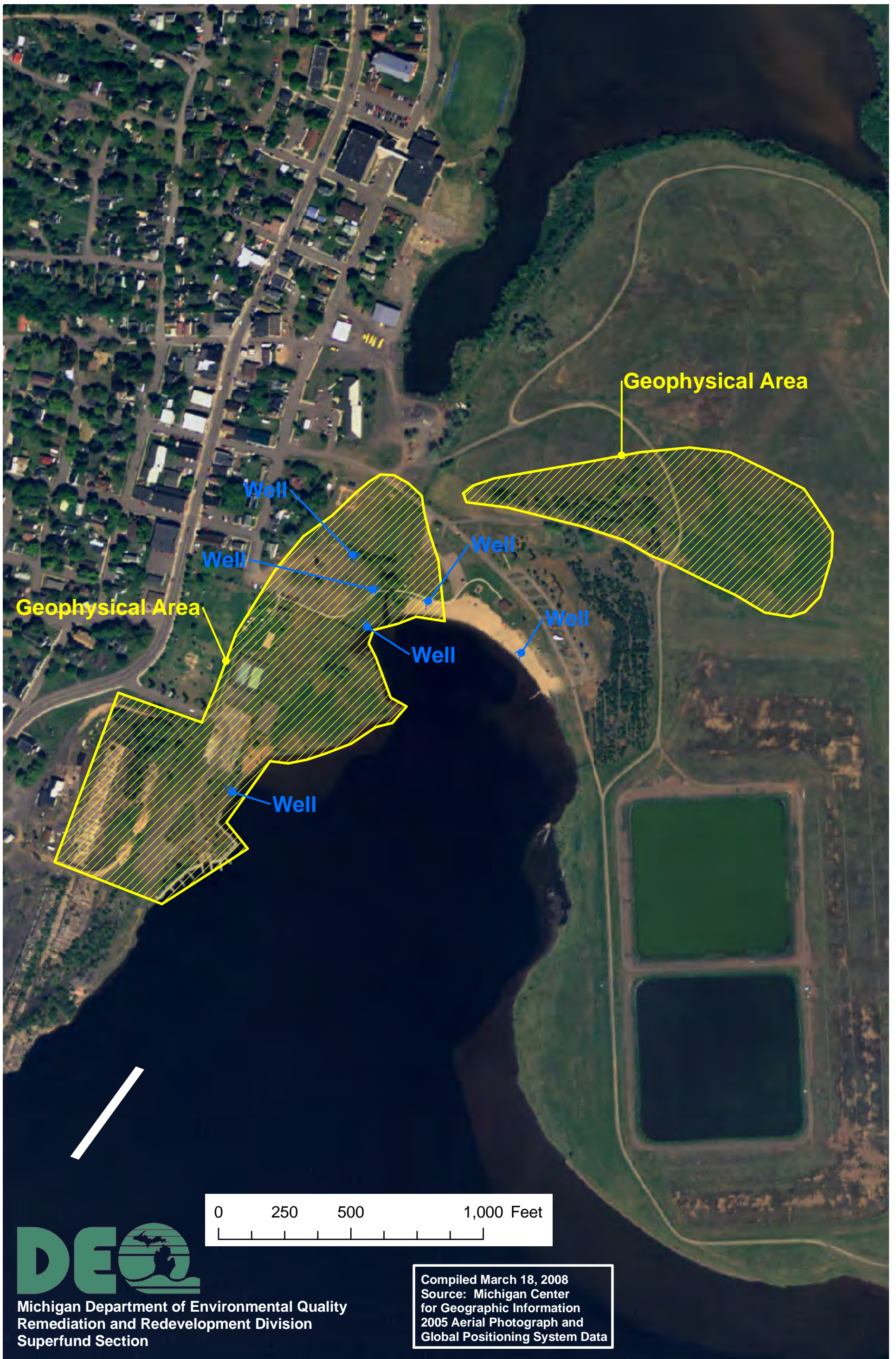
0 250 500 Feet

Compiled December 2008
Source: Michigan Center
for Geographic Information
2005 Aerial Photograph and
Global Positioning System Data

Figure 6
Lake Linden Stampsands Core Sample Locations
Torch Lake Superfund Site



Figure 7
Lake Linden Stampsands Potential Investigation Areas
Torch Lake Superfund Site



Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

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Figure 1
the pushpoint sampler

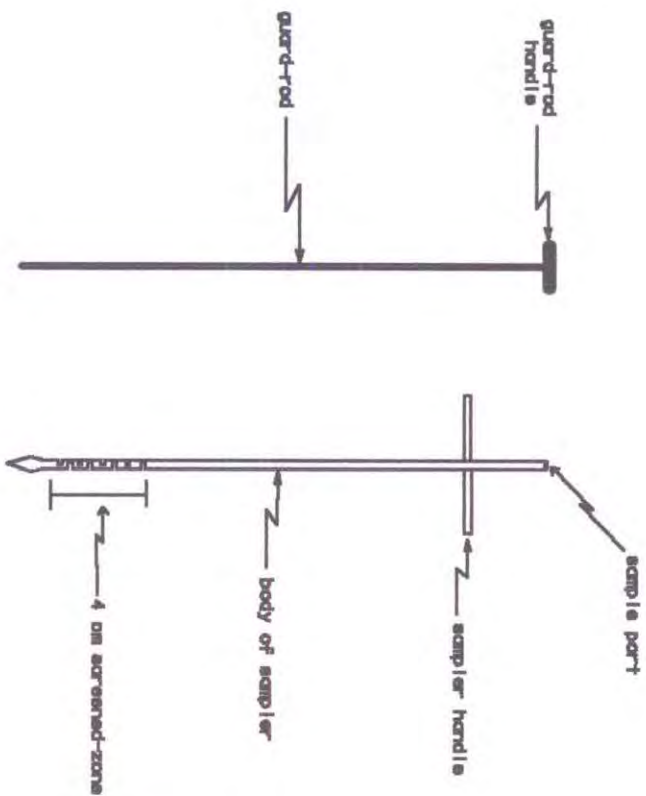


Fig. 1a
disassembled sampler

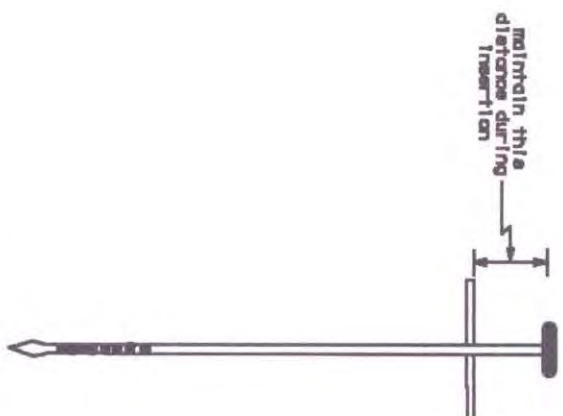


Fig. 1b
assembled sampler

Figure 2

grasp instrument firmly
and squeeze two handles
together to maintain
this distance while
inserting into sediments

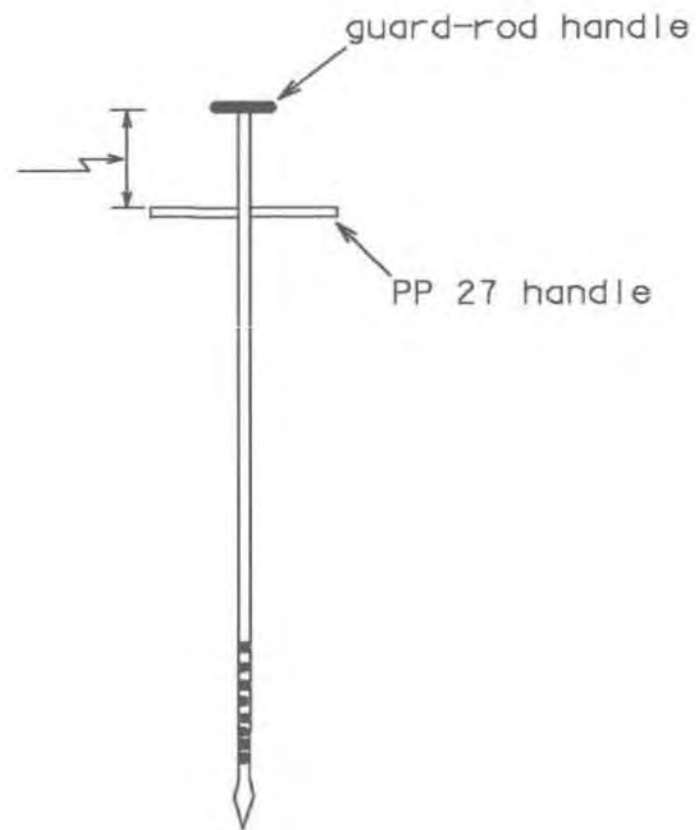


Figure 3

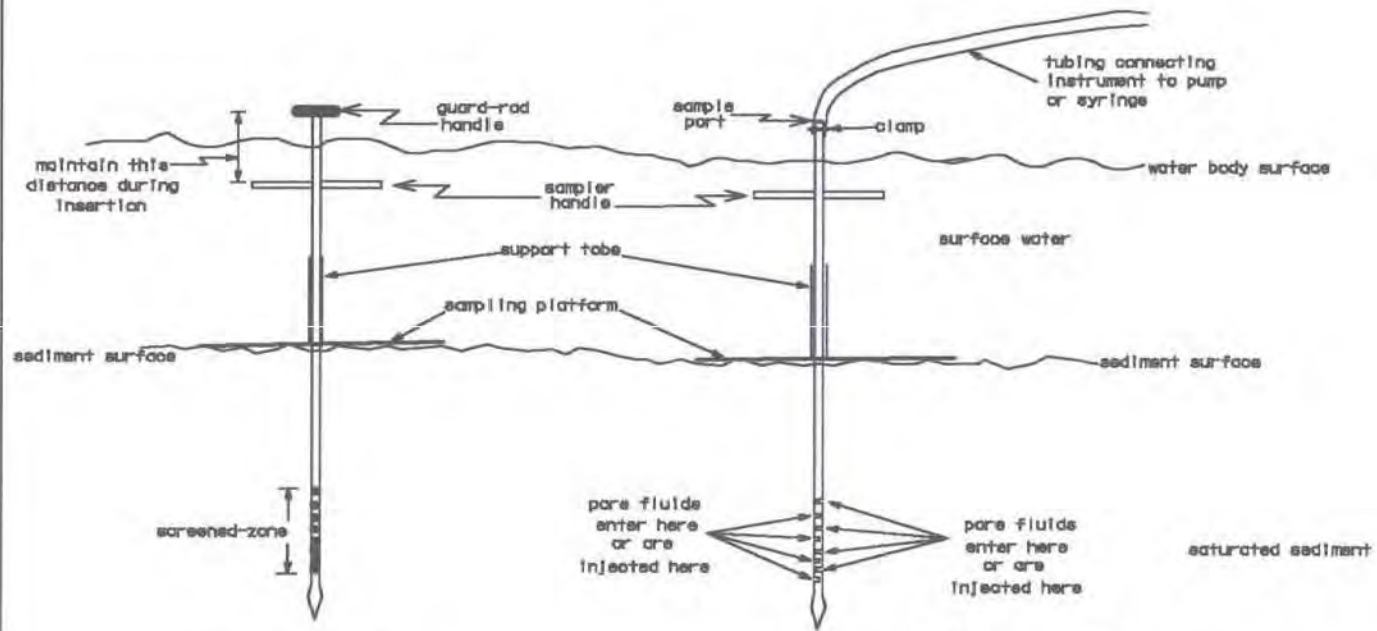
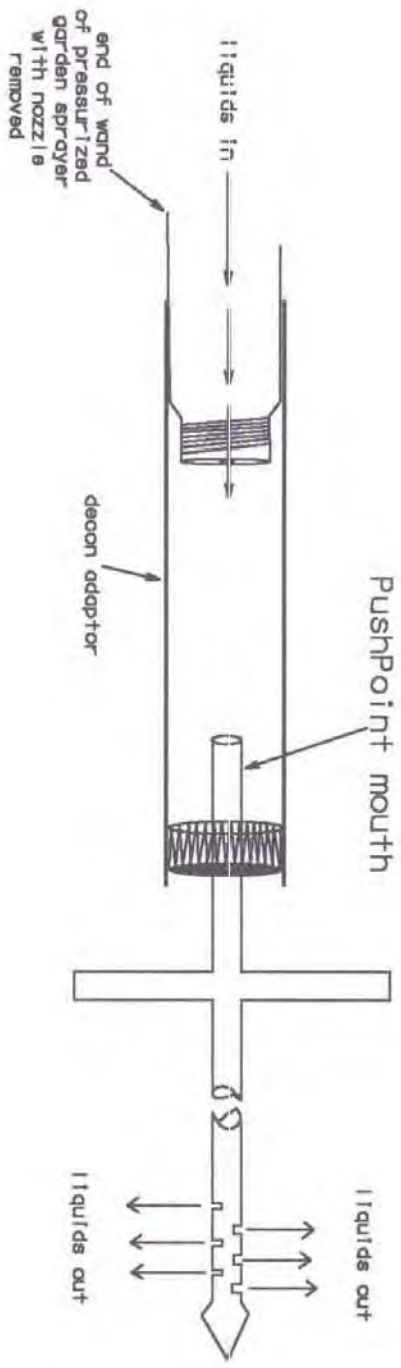


Fig. 3a
configuration when
installing in sediments

Fig. 3b
configuration while
sampling groundwater

Figure 4

attachment of decon adaptor



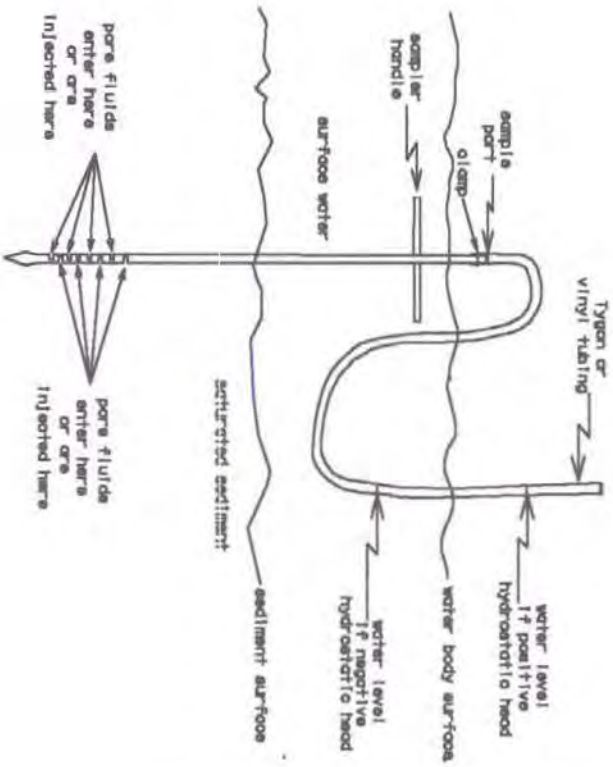


Figure 5

MAR Products, Inc.

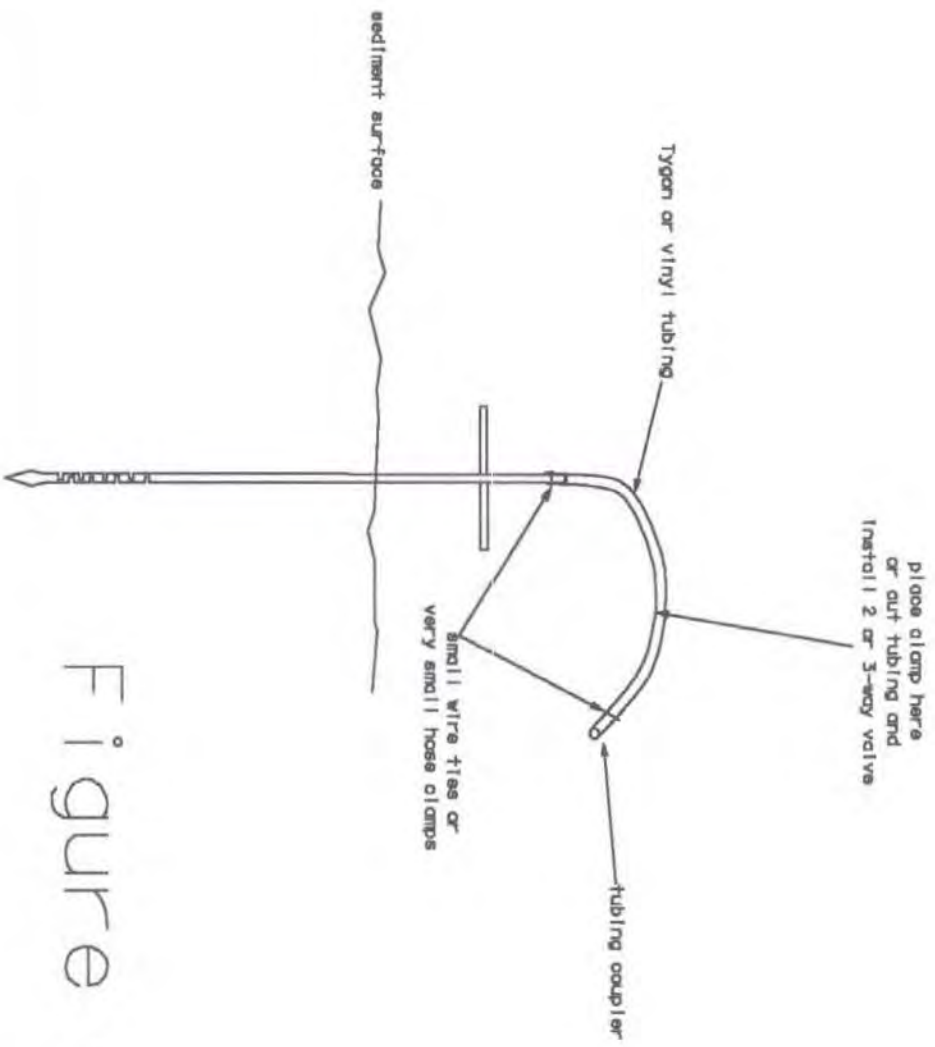


Figure 6

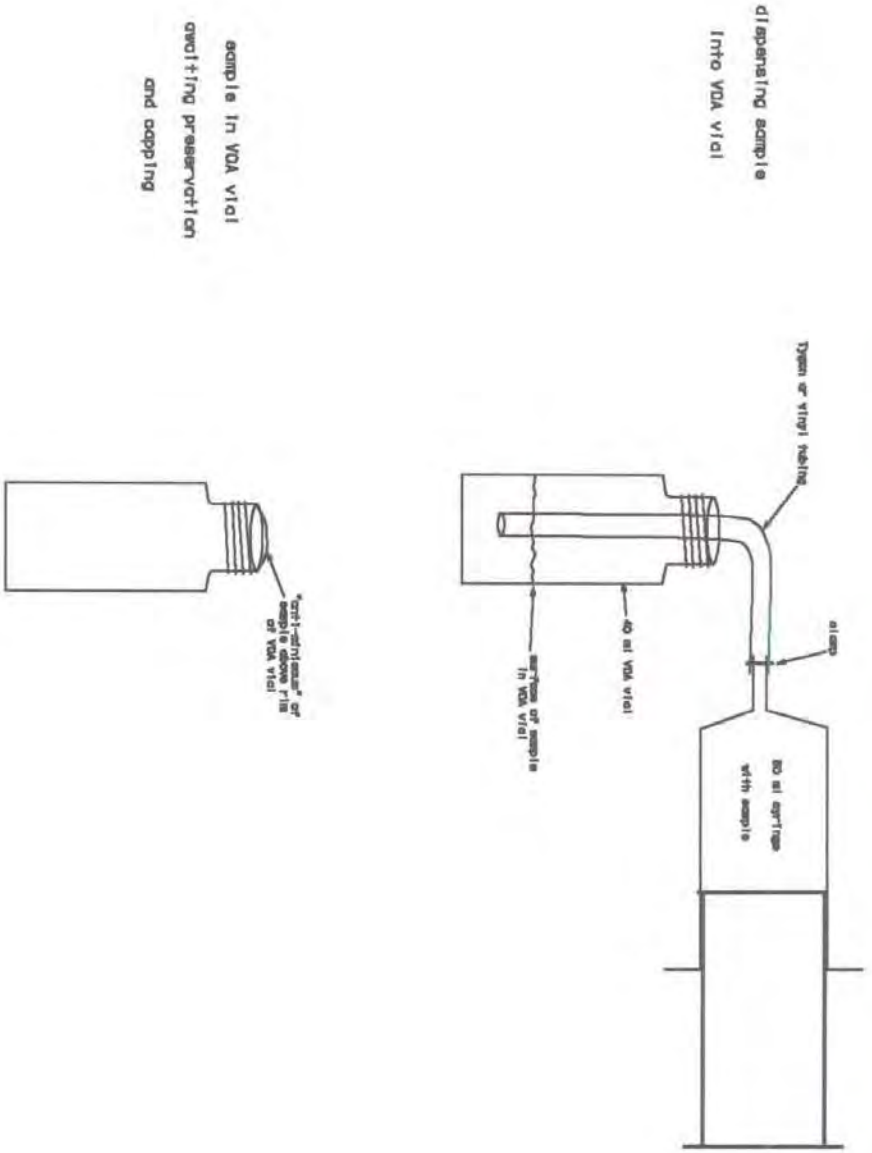


Figure 7
 Filling VOA vial "headspace free"

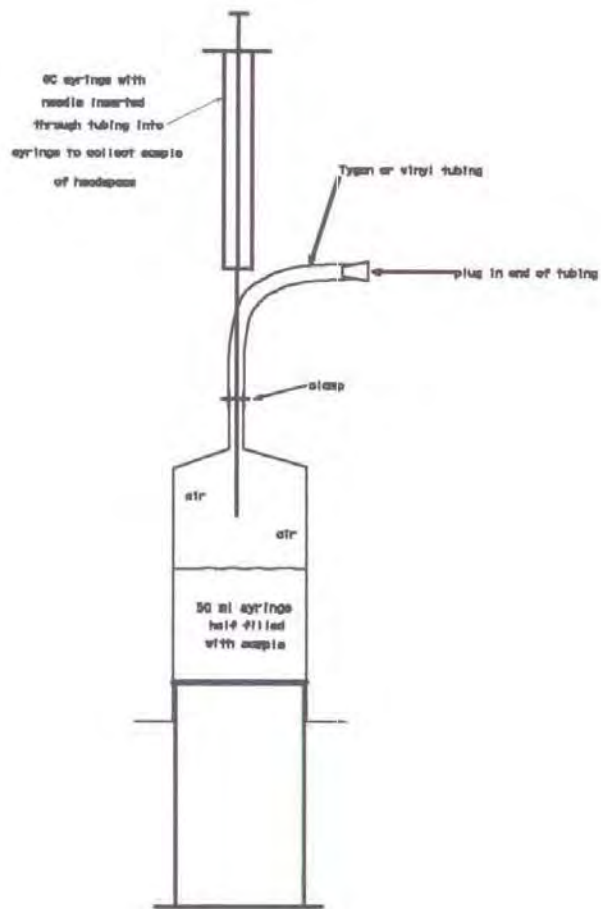


Figure 8



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Division: RRD
Report to: BARB VETORT
 MDEQ-RRD-SUPERFUND
 CONSTITUTION HALL
 525 WEST ALLEGAN, LANSING, MI 48909

Lab Work Order #: 80800103
Work Site ID: 31000003
Site Name: TORCH LAKE
Received: 08/11/2008
Reported: 09/19/2008
Collected By: BARB VETORT

Total: \$15,052.00

Samples Received :

No:	Sample ID	Sample Description	Matrix:	Collection Date
01	AB20901	W-16L	WATER	08/07/2008
02	AB20902	W-16E	WATER	08/07/2008
03	AB20903	W-43	WATER	08/07/2008
04	AB20904	W-33	WATER	08/07/2008
05	AB20905	H-101	WATER	08/07/2008
06	AB20906	H-104	WATER	08/07/2008
07	AB20907	H-29	WATER	08/07/2008
08	AB20908	H-22	WATER	08/07/2008
09	AB20909	H-16	WATER	08/07/2008
10	AB20910	W-38	WATER	08/07/2008
11	AB20911	H-225	WATER	08/08/2008
12	AB20912	W-55	WATER	08/08/2008
13	AB20913	H-59	WATER	08/08/2008
14	AB20914	W-73	WATER	08/08/2008
15	AB20915	W-76	WATER	08/08/2008
16	AB20916	W-78	WATER	08/08/2008
17	AB20917	H-70	WATER	08/08/2008
18	AB20918	BRIDGE 1	WATER	08/08/2008
19	AB20919	H-209	WATER	08/08/2008
20	AB20920	H-50	WATER	08/08/2008
21	AB20921	H-2	WATER	08/06/2008
22	AB20922	W-72	WATER	08/08/2008

I certify that the analysis performed by the MDEQ Environmental Laboratory are accurate and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Bob Avery, Laboratory Director



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: AB20901 W-16L

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 940

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	57.5			
SURROGATE	#Tetrachloro-m-xylene#	37.8			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.11		1.0
11104-28-2	Aroclor 1221	Not Detected	0.11		1.0
11141-16-5	Aroclor 1232	Not Detected	0.11		1.0
53469-21-9	Aroclor 1242	Not Detected	0.11		1.0
12672-29-6	Aroclor 1248	Not Detected	0.11		1.0
11097-69-1	Aroclor 1254	Not Detected	0.11		1.0
11096-82-5	Aroclor 1260	Not Detected	0.11		1.0
37324-23-5	Aroclor 1262	Not Detected	0.11		1.0
11100-14-4	Aroclor 1268	Not Detected	0.11		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.11		1.0

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

ug / Kg : microgram / kilogram (ppb)

mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts

Inorganic Unit Mgr: Sandy Gregg

Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
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Sample Number: AB20901 W-16L

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	98.4			
SURROGATE	#Dibromofluoromethane#	103			
SURROGATE	#Toluene-d8#	100			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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 FAX: (517) 335-9600

Sample Number: AB20901 W-16L

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmethylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH

Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:** **Volume:** 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
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CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

ug / Kg : microgram / kilogram (ppb)

mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts

Inorganic Unit Mgr: Sandy Gregg

Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20901 W-16L

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	48.6			
SURROGATE	#2,4,6-Tribromophenol#	84.7			
SURROGATE	#2-Fluorophenol#	24.3			
SURROGATE	#Nitrobenzene - D5#	46.7			
SURROGATE	#Phenol - D6#	17.5			
SURROGATE	#p-Terphenyl-D14#	79.2			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.2		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.2		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.2		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.2		1.0
95-51-2	2-Chloroaniline	Not Detected	5.2		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.2		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.2		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.2		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	52		1.0

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Sample Number: AB20901 W-16L

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.2		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.2		1.0
86-74-8	Carbazole	Not Detected	5.2		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.2		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.2		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.2		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.2		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.2		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.2		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.2		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

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Sample	AB20901	W-16L						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	1410	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	1410	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	46	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	27	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	7	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	110	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	83	mg N/L	5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	2.4	mg P/L	0.5	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	1.4	µg/L	1		09/05/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	44	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	28000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	64	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	21	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	3100	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	34	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	1.8	µg/L	1		08/28/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	63	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	690	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	54000	µg/L	200	D	08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	12	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	80	mg N/L	5	D	08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	2420	umhos/cm			08/14/2008	120.1	JB
	pH	6.68	pH			08/11/2008	150.1	TK
7440-44-0	TOC	44	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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Sample Number: AB20902 W-16E

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	73.4			
SURROGATE	#Tetrachloro-m-xylene#	49.0			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20902 W-16E

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	96.6			
SURROGATE	#Dibromofluoromethane#	102			
SURROGATE	#Toluene-d8#	99.9			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

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Sample Number: AB20902 W-16E

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH

Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:** **Volume:** 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
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CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
Inorganic Unit Mgr: Sandy Gregg
Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20902 W-16E

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	42.3			
SURROGATE	#2,4,6-Tribromophenol#	83.4			
SURROGATE	#2-Fluorophenol#	22.4			
SURROGATE	#Nitrobenzene - D5#	40.9			
SURROGATE	#Phenol - D6#	15.8			
SURROGATE	#p-Terphenyl-D14#	76.0			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.2		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.2		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.2		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.2		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.2		1.0
95-51-2	2-Chloroaniline	Not Detected	5.2		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.2		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.2		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.2		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.2		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	52		1.0

CAS# : Chemical Abstract Service Registry Number
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ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB20902 W-16E

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/22/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.2		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.2		1.0
86-74-8	Carbazole	Not Detected	5.2		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.2		1.0
84-66-2	Diethylphthalate	Not Detected	5.2		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.2		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.2		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.2		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.2		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.2		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.2		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

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Sample	AB20902	W-16E						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	1460	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	1460	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	56	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	22	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	5	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	120	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	76	mg N/L	5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	2.0	mg P/L	0.5	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	96	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	2.5	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	11000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	5.3	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	3700	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	15	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	3.4	µg/L	1		08/28/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	600	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	81000	µg/L	200	D	08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	72	mg N/L	4	D	08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	4	D	08/14/2008	353.2	RA
	Conductance	2505	umhos/cm			08/14/2008	120.1	JB
	pH	6.67	pH			08/11/2008	150.1	TK
7440-44-0	TOC	46	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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 ug / Kg : microgram / kilogram (ppb)
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P.O. Box 30270
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 TEL: (517) 335-9800
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Sample Number: AB20903 W-43

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	76.9			
SURROGATE	#Tetrachloro-m-xylene#	35.7			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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ENVIRONMENTAL LABORATORY

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: **AB20903** **W-43**

Volatile Compounds with Library Search

Analytical Method: 8260 Date Tested: 08/15/2008 Analyst: RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	97.5			
SURROGATE	#Dibromofluoromethane#	101			
SURROGATE	#Toluene-d8#	99.2			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	4.1	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	11	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
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ug / L : microgram / liter (ppb)
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Sample Number: AB20903 W-43

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH

Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:** **Volume:** 970

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



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 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20903 W-43

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/22/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	48.8			
SURROGATE	#2,4,6-Tribromophenol#	78.8			
SURROGATE	#2-Fluorophenol#	23.9			
SURROGATE	#Nitrobenzene - D5#	46.5			
SURROGATE	#Phenol - D6#	17.4			
SURROGATE	#p-Terphenyl-D14#	79.7			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.2		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.2		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.2		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.2		1.0
95-51-2	2-Chloroaniline	Not Detected	5.2		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.2		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.2		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.2		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	52		1.0

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 Lansing, MI 48909
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 FAX: (517) 335-9600

Sample Number: **AB20903** **W-43**

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/22/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.2		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.2		1.0
86-74-8	Carbazole	Not Detected	5.2		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.2		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.2		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.2		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.2		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.2		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.2		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.2		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

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 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample	AB20903	W-43						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	264	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	264	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	67	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	43	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	25	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	18	mg N/L	1	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.15	mg P/L	0.1	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	48	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	350	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	29	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	730	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	2.3	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	58	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	39000	µg/L	200	D	09/11/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	17	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	748	umhos/cm			08/14/2008	120.1	JB
	pH	6.58	pH			08/11/2008	150.1	TK
7440-44-0	TOC	8.7	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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Sample Number: AB20904 W-33

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	68.0			
SURROGATE	#Tetrachloro-m-xylene#	25.7			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20904 W-33

Volatile Compounds with Library Search

Analytical Method: 8260 Date Tested: 08/15/2008 Analyst: RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	97.4			
SURROGATE	#Dibromofluoromethane#	102			
SURROGATE	#Toluene-d8#	99.2			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
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Sample Number: AB20904 W-33

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmethylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
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CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



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P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20904 W-33

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	44.8			
SURROGATE	#2,4,6-Tribromophenol#	71.4			
SURROGATE	#2-Fluorophenol#	24.1			
SURROGATE	#Nitrobenzene - D5#	44.9			
SURROGATE	#Phenol - D6#	16.5			
SURROGATE	#p-Terphenyl-D14#	75.0			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.1		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.1		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.1		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.1		1.0
95-51-2	2-Chloroaniline	Not Detected	5.1	3,7	1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.1		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.1		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.1		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	51		1.0

CAS# : Chemical Abstract Service Registry Number
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ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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Sample Number: **AB20904 W-33**

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/22/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.1		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.1		1.0
86-74-8	Carbazole	Not Detected	5.1		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.1		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.1		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.1		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.1		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	7Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.1	3,7	1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0	3	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.1		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.1		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	3	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
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ug / L : microgram / liter (ppb)
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 ug / Kg : microgram / kilogram (ppb)
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Sample	AB20904	W-33						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	490	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	490	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	46	mg/L	1		08/13/2008	325.2	LU
	Sulfate	6	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H PI	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	11	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	67	mg N/L	5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	ND	mg P/L	0.5	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	2.1	µg/L	1		09/05/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	25	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	750	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	780	µg/L	1		09/03/2008	6020/200.8	KS
7439-92-1	Lead - Total	5.2	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	480	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	4.2	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	0.22	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	4.4	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	12	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	750	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	ND	µg/L	20		08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	64	mg N/L	5	D	08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	1111	umhos/cm			08/14/2008	120.1	JB
	pH	7.42	pH			08/11/2008	150.1	TK
7440-44-0	TOC	4.5	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number

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ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

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mg / Kg : milligram / kilogram (ppm)

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Sample Number: AB20905 H-101

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 1000
Dilution Factor

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	46.4			
SURROGATE	#Tetrachloro-m-xylene#	38.9			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

CAS# : Chemical Abstract Service Registry Number
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Sample Number: AB20905 H-101

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	96.1			
SURROGATE	#Dibromofluoromethane#	102			
SURROGATE	#Toluene-d8#	100			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
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TEL: (517) 335-9800
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Sample Number: AB20905 H-101

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 1000

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



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 ENVIRONMENTAL LABORATORY

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 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20905 H-101

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	48.6			
SURROGATE	#2,4,6-Tribromophenol#	94.9			
SURROGATE	#2-Fluorophenol#	24.8			
SURROGATE	#Nitrobenzene - D5#	47.6			
SURROGATE	#Phenol - D6#	17.1			
SURROGATE	#p-Terphenyl-D14#	78.2			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.0		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.0		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.0		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	25		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.0		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.0		1.0
95-51-2	2-Chloroaniline	Not Detected	5.0		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.0		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.0		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	25		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.0		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	50		1.0

CAS# : Chemical Abstract Service Registry Number
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ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
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Lansing, MI 48909
TEL: (517) 335-9800
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Sample Number: **AB20905 H-101**

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.0		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.0		1.0
86-74-8	Carbazole	Not Detected	5.0		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.0		1.0
84-66-2	Diethylphthalate	Not Detected	5.0		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.0		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.0		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.0		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.0		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.0		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.0		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
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mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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Sample	AB20905	H-101						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	587	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	587	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	60	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	27	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	5	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	64	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	23	mg N/L	1	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	1.5	mg P/L	0.1	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	7.7	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	18000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	3.9	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	1.1	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1600	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	22	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	1.1	µg/L	1		08/28/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	15	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	540	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	50000	µg/L	200	D	08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	22	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	1276	umhos/cm			08/14/2008	120.1	JB
	pH	6.64	pH			08/11/2008	150.1	TK
7440-44-0	TOC	24	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB20906 H-104

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 1000
Dilution Factor

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	45.2			
SURROGATE	#Tetrachloro-m-xylene#	40.6			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20906 H-104

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	98.0			
SURROGATE	#Dibromofluoromethane#	101			
SURROGATE	#Toluene-d8#	99.6			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	1.6	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	1.5	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
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 ND : Not Detected

ug / L : microgram / liter (ppb)
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Sample Number: AB20906 H-104

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 1000

CAS # Compound Result ug/L RL Qualifier Dilution Factor

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: AB20906 H-104

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	67.8			
SURROGATE	#2,4,6-Tribromophenol#	99.9			
SURROGATE	#2-Fluorophenol#	33.0			
SURROGATE	#Nitrobenzene - D5#	66.4			
SURROGATE	#Phenol - D6#	23.0			
SURROGATE	#p-Terphenyl-D14#	79.6			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.0		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.0		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.0		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	25		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.0		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.0		1.0
95-51-2	2-Chloroaniline	Not Detected	5.0		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.0		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.0		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	25		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.0		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	50		1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
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ug / L : microgram / liter (ppb)
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ug / Kg : microgram / kilogram (ppb)
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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: **AB20906 H-104**

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.0		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.0		1.0
86-74-8	Carbazole	Not Detected	5.0		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.0		1.0
84-66-2	Diethylphthalate	Not Detected	5.0		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.0		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.0		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.0		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.0		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.0		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.0		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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Sample	AB20906	H-104						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	568	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	568	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	55	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	20	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	7	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	72	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	20	mg N/L	1	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	1.2	mg P/L	0.1	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/28/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	30	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	22000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	9.3	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	14	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1000	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	39	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	1.0	µg/L	1		08/28/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	83	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	580	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	37000	µg/L	200	D	08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	18	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	1290	umhos/cm			08/14/2008	120.1	JB
	pH	6.80	pH			08/11/2008	150.1	TK
7440-44-0	TOC	27	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

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mg / Kg : milligram / kilogram (ppm)

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P.O. Box 30270
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Sample Number: AB20907 H-29

Pesticides and PCBs

Analytical Method: 8081,8082
 Extraction Method: 3510

Date Tested: 08/26/2008
 Extraction Date: 08/12/2008

Analyst: MF
 Qualifier:

Volume: 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	77.5			
SURROGATE	#Tetrachloro-m-xylene#	37.7			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20907 H-29

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	96.8			
SURROGATE	#Dibromofluoromethane#	100			
SURROGATE	#Toluene-d8#	99.1			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
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TEL: (517) 335-9800
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Sample Number: AB20907 H-29

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/22/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
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CAS# : Chemical Abstract Service Registry Number	ug / L : microgram / liter (ppb)	Laboratory Contacts
RL : Reporting Limit	mg / L : milligram / liter (ppm)	Inorganic Unit Mgr: Sandy Gregg
ND : Not Detected	ug / Kg : microgram / kilogram (ppb)	Organic Unit Mgr: Carol Smith
	mg / Kg : milligram / kilogram (ppm)	Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20907 H-29

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	53.0			
SURROGATE	#2,4,6-Tribromophenol#	84.7			
SURROGATE	#2-Fluorophenol#	27.6			
SURROGATE	#Nitrobenzene - D5#	53.7			
SURROGATE	#Phenol - D6#	19.1			
SURROGATE	#p-Terphenyl-D14#	87.6			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.3		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.2		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	11		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.3		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.3		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.3		1.0
95-51-2	2-Chloroaniline	Not Detected	5.3		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	11		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.3		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	11		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.3		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.3		1.0
106-47-8	4-Chloroaniline	Not Detected	11		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.1		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.1		1.0
208-96-8	Acenaphthylene	Not Detected	1.1		1.0
62-53-3	Aniline	Not Detected	4.2		1.0
120-12-7	Anthracene	Not Detected	1.1		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.1		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.1		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.1		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.1		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.1		1.0
100-51-6	Benzyl Alcohol	Not Detected	53		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
 Inorganic Unit Mgr: Sandy Gregg
 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: **AB20907 H-29**

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/22/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.1		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.1		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.3		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.3		1.0
86-74-8	Carbazole	Not Detected	5.3		1.0
218-01-9	Chrysene	Not Detected	1.1		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.2		1.0
84-66-2	Diethylphthalate	Not Detected	5.3		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.3		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.3		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.3		1.0
206-44-0	Fluoranthene	Not Detected	1.1		1.0
86-73-7	Fluorene	Not Detected	1.1		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.1		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.1		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	11	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.1		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.1		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.3		1.0
91-20-3	Naphthalene	Not Detected	1.1		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.1	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.3		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.1		1.0
108-95-2	Phenol	Not Detected	5.3		1.0
129-00-0	Pyrene	Not Detected	1.1		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.1	8	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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Sample	AB20907	H-29						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	179	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	179	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	40	mg/L	1		08/13/2008	325.2	LU
	Sulfate	3	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	17	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	4.0	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.35	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	7.8	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	380	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	9.7	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	1.0	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	410	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	ND	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	240	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	2500	µg/L	20		08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	3.6	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	482	umhos/cm			08/14/2008	120.1	JB
	pH	7.35	pH			08/11/2008	150.1	TK
7440-44-0	TOC	6.3	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

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mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts

Inorganic Unit Mgr: Sandy Gregg

Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



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P.O. Box 30270
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 FAX: (517) 335-9600

Sample Number: AB20908 H-22

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 990

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	62.0			
SURROGATE	#Tetrachloro-m-xylene#	55.6			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Laboratory Contacts

Inorganic Unit Mgr: Sandy Gregg

Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



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Sample Number: AB20908 H-22

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	97.3			
SURROGATE	#Dibromofluoromethane#	101			
SURROGATE	#Toluene-d8#	98.9			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Laboratory Contacts
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Sample Number: AB20908 H-22

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmethylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/25/2008 **Analyst:** SMH

Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:** **Volume:** 970

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
 Inorganic Unit Mgr: Sandy Gregg
 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



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 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20908 H-22

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	46.7			
SURROGATE	#2,4,6-Tribromophenol#	62.7			
SURROGATE	#2-Fluorophenol#	19.7			
SURROGATE	#Nitrobenzene - D5#	45.7			
SURROGATE	#Phenol - D6#	15.2			
SURROGATE	#p-Terphenyl-D14#	90.3			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.2		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.2		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.2		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.2		1.0
95-51-2	2-Chloroaniline	Not Detected	5.2		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.2		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.2		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.2		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	52		1.0

CAS# : Chemical Abstract Service Registry Number
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 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: AB20908 H-22

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.2		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.2		1.0
86-74-8	Carbazole	Not Detected	5.2		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.2		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.2		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.2		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.2		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.2		1.0
91-20-3	Naphthalene	1.5	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.2		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.2		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.
Probable petroleum product(s) present.

CAS# : Chemical Abstract Service Registry Number
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ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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Sample	AB20908	H-22						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	336	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	336	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	52	mg/L	1		08/13/2008	325.2	LU
	Sulfate	4	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	7	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	16	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	1.3	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.17	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	6100	µg/L	50	D	09/03/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	49	µg/L	1	3	09/03/2008	6020/200.8	LS
7440-39-3	Barium - Total	1200	µg/L	5	D	08/22/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	11	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	3800	µg/L	1	D	08/22/2008	6020/200.8	KS
7439-92-1	Lead - Total	22	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1900	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	22	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		09/03/2008	6020/200.8	LS
7440-22-4	Silver -Total	4.3	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	30	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	52	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	360	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	15000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	1.1	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	744	umhos/cm			08/14/2008	120.1	JB
	pH	7.06	pH			08/11/2008	150.1	TK
7440-44-0	TOC	4.9	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number

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mg / L : milligram / liter (ppm)

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Sample Number: AB20909 H-16

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	64.7			
SURROGATE	#Tetrachloro-m-xylene#	48.1			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20909 H-16

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	96.7			
SURROGATE	#Dibromofluoromethane#	102			
SURROGATE	#Toluene-d8#	99.0			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
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Sample Number: AB20909 H-16

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmethylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/25/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:** **Volume:** 980

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
Inorganic Unit Mgr: Sandy Gregg
Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



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 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20909 H-16

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	39.8			
SURROGATE	#2,4,6-Tribromophenol#	79.7			
SURROGATE	#2-Fluorophenol#	20.6			
SURROGATE	#Nitrobenzene - D5#	38.8			
SURROGATE	#Phenol - D6#	14.4			
SURROGATE	#p-Terphenyl-D14#	87.9			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.1		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.1		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.1		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.1		1.0
95-51-2	2-Chloroaniline	Not Detected	5.1		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.1		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.1		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.1		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	51		1.0

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 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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Sample Number: AB20909 H-16

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.1		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.1		1.0
86-74-8	Carbazole	Not Detected	5.1		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.1		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.1		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.1		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.1		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.1		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.1		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.1		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
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ug / L : microgram / liter (ppb)
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 ug / Kg : microgram / kilogram (ppb)
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Sample	AB20909	H-16						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	278	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	278	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	35	mg/L	1		08/13/2008	325.2	LU
	Sulfate	4	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	8	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/14/2008	9010/335.2	RG
	COD	26	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	8.2	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.68	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	34	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	710	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	1.2	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1800	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	3.7	µg/L	2.0		08/22/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	11	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	1200	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	20000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	7.8	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	619	umhos/cm			08/14/2008	120.1	JB
	pH	6.82	pH			08/11/2008	150.1	TK
7440-44-0	TOC	9.2	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number
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Lansing, MI 48909
TEL: (517) 335-9800
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Sample	AB20910	W-38						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	369	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	369	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	80	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	8	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	9.9	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	4.9	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.02	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/28/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	2.6	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	710	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	0.95	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	1.6	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	440	µg/L	1		09/03/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1100	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	4.1	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	0.42	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	3.6	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	26	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	160	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	47	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	4.5	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	918	umhos/cm			08/14/2008	120.1	JB
	pH	7.14	pH			08/11/2008	150.1	TK
7440-44-0	TOC	4.4	mg/L	0.5		08/12/2008	415.1	MB

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: AB20911 H-225

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 960

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	73.8			
SURROGATE	#Tetrachloro-m-xylene#	40.7			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20911 H-225

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	97.0			
SURROGATE	#Dibromofluoromethane#	102			
SURROGATE	#Toluene-d8#	99.2			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0	5	1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

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 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB20911 H-225

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/15/2008 **Analyst:** RD

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/25/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
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CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB20911 H-225

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/25/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	33.6			
SURROGATE	#2,4,6-Tribromophenol#	76.7			
SURROGATE	#2-Fluorophenol#	16.4			
SURROGATE	#Nitrobenzene - D5#	31.1			
SURROGATE	#Phenol - D6#	12.3			
SURROGATE	#p-Terphenyl-D14#	86.2			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.1		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.3		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.2		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	11		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.3		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.3		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.3		1.0
95-51-2	2-Chloroaniline	Not Detected	5.3		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.1		1.0
95-57-8	2-Chlorophenol	Not Detected	11		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	21		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.3		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	11		1.0
88-74-4	2-Nitroaniline	Not Detected	21		1.0
88-75-5	2-Nitrophenol	Not Detected	5.3		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	21		1.0
99-09-2	3-Nitroaniline	Not Detected	21		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.1		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.3		1.0
106-47-8	4-Chloroaniline	Not Detected	11		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.1		1.0
100-01-6	4-Nitroaniline	Not Detected	21		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.1		1.0
208-96-8	Acenaphthylene	Not Detected	1.1		1.0
62-53-3	Aniline	Not Detected	4.2		1.0
120-12-7	Anthracene	Not Detected	1.1		1.0
103-33-3	Azobenzene	Not Detected	2.1		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.1		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.1		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.1		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.1		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.1		1.0
100-51-6	Benzyl Alcohol	Not Detected	53		1.0

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Sample Number: AB20911 H-225

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 950

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.1		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.1		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.1		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.3		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.3		1.0
86-74-8	Carbazole	Not Detected	5.3		1.0
218-01-9	Chrysene	Not Detected	1.1		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.1		1.0
132-64-9	Dibenzofuran	Not Detected	4.2		1.0
84-66-2	Diethylphthalate	Not Detected	5.3		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.3		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.3		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.3		1.0
206-44-0	Fluoranthene	Not Detected	1.1		1.0
86-73-7	Fluorene	Not Detected	1.1		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.1		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.1		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	11	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.1		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.1		1.0
78-59-1	Isophorone	Not Detected	1.1		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.3		1.0
91-20-3	Naphthalene	Not Detected	1.1		1.0
98-95-3	Nitrobenzene	Not Detected	2.1		1.0
100-61-8	N-methylaniline	Not Detected	1.1	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.3		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.1		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.1		1.0
87-86-5	Pentachlorophenol	Not Detected	21		1.0
85-01-8	Phenanthrene	Not Detected	1.1		1.0
108-95-2	Phenol	Not Detected	5.3		1.0
129-00-0	Pyrene	Not Detected	1.1		1.0
110-86-1	Pyridine	Not Detected	21		1.0
632-22-4	Tetramethylurea	Not Detected	1.1	8	1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
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Sample	AB20911	H-225						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	485	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	485	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	46	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	22	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	23	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	1.8	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.02	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	12	µg/L	1	3	08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	2600	µg/L	5	D	08/22/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	13	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	6.4	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1900	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	4.4	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	980	µg/L	20		08/28/2008	6010/200.7	EG
7439-89-6	Iron - Total	6500	µg/L	20		08/28/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		08/28/2008	6010/200.7	EG
7664-41-7	Ammonia	1.4	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	1021	umhos/cm			08/14/2008	120.1	JB
	pH	7.16	pH			08/11/2008	150.1	TK
7440-44-0	TOC	8.5	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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Sample	AB20912	W-55						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	467	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	467	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	49	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	27	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	12	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	8.5	mg N/L	0.5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	ND	mg P/L	0.05	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	64	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/28/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	740	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	230	µg/L	1		09/03/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	490	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	4.4	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	0.21	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	2.5	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	1400	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	56	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	8.1	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	995	umhos/cm			08/14/2008	120.1	JB
	pH	7.25	pH			08/11/2008	150.1	TK
7440-44-0	TOC	3.5	mg/L	0.5		08/12/2008	415.1	MB

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

ug / Kg : microgram / kilogram (ppb)

mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts

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Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample	AB20913	H-59						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	276	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	276	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	30	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	4	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	5	µg/L	5	H	08/12/2008	7196	TK2
	COD	23	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	9.5	mg N/L	0.5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	1.0	mg P/L	0.05	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	52	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	15	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	430	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	54	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1600	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	3.0	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	630	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	15000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	8.9	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	735	umhos/cm			08/14/2008	120.1	JB
	pH	6.80	pH			08/11/2008	150.1	TK
7440-44-0	TOC	7.5	mg/L	0.5		08/12/2008	415.1	MB

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 Systems Mgmt Unit: George Krisztian



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 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample	AB20914	W-73						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	81	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	81	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	3	mg/L	1		08/13/2008	325.2	LU
	Sulfate	2	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	ND	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	.56	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.01	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/22/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	2.8	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	89	µg/L	5		08/22/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	35	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	39	µg/L	5		08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	ND	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/21/2008	6020/200.8	KS
7440-42-8	Boron - Total	45	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	20	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	.51	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.01		08/14/2008	353.2	RA
	Conductance	184	umhos/cm			08/14/2008	120.1	JB
	pH	8.22	pH			08/11/2008	150.1	TK
7440-44-0	TOC	ND	mg/L	0.5		08/12/2008	415.1	MB

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P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample	AB20915	W-76						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	189	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	189	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	4	mg/L	1		08/13/2008	325.2	LU
	Sulfate	2	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	5	µg/L	5	H	08/12/2008	7196	TK2
	COD	5.2	mg/L	5	P	08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	1.4	mg N/L	0.10	P	08/18/2008	351.2	DS1
	Very high amount of silt/sediment in sample (about 3/4) pH = 6							
7723-14-0	Total Phosphorus	.02	mg P/L	0.010	P	08/18/2008	365.4	DS1
	Very high amount of silt/sediment in sample (about 3/4) pH = 6							
7429-90-5	Aluminium - Total	830	µg/L	50		09/03/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	10	I	09/05/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	10	µg/L	1		09/03/2008	6020/200.8	LS
7440-39-3	Barium - Total	17000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	10	I	09/03/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	2.5	µg/L	0.2		09/03/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	10	I	09/03/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		09/03/2008	6020/200.8	KS
7440-50-8	Copper - Total	13000	µg/L	1	D	09/03/2008	6020/200.8	KS
7439-92-1	Lead - Total	1.1	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	12000	µg/L	5	D	09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		09/03/2008	6020/200.8	KS
7440-02-0	Nickel - Total	150	µg/L	2.0		09/03/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	10	I	09/03/2008	6020/200.8	LS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	10	I	09/03/2008	6020/200.8	KS
7440-66-6	Zinc - Total	47	µg/L	10		09/03/2008	6020/200.8	KS
7440-42-8	Boron - Total	86	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	11000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	1.3	mg N/L	0.01	P	08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	1.6	mg N/L	0.1	D P	08/14/2008	353.2	RA
	Conductance	370	umhos/cm			08/14/2008	120.1	JB
	pH	8.10	pH			08/11/2008	150.1	TK
7440-44-0	TOC	2.7	mg/L	0.5	P	08/12/2008	415.1	MB

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 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample	AB20916	W-78						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	383	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	383	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	8	mg/L	1		08/13/2008	325.2	LU
	Sulfate	24	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	6.6	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	3.5	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.07	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	73	µg/L	50		08/21/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	2.1	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	230	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	110	µg/L	1		09/03/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	570	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	3.7	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-22-4	Silver -Total	0.39	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/22/2008	6020/200.8	KS
7440-42-8	Boron - Total	440	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	79	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	3.3	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	713	umhos/cm			08/14/2008	120.1	JB
	pH	7.22	pH			08/11/2008	150.1	TK
7440-44-0	TOC	2.1	mg/L	0.5		08/12/2008	415.1	MB

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P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample	AB20917	H-70						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	241	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	241	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	622	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	25	mg/L	2	D	08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	17	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	1.7	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	ND	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/21/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	3.0	µg/L	1		08/22/2008	6020/200.8	KS
7440-39-3	Barium - Total	590	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	16	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	860	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	5.6	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/22/2008	6020/200.8	KS
7440-42-8	Boron - Total	140	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	17000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	1.2	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
	Conductance	2438	umhos/cm			08/14/2008	120.1	JB
	pH	6.84	pH			08/11/2008	150.1	TK
7440-44-0	TOC	4.8	mg/L	0.5		08/12/2008	415.1	MB

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

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mg / L : milligram / liter (ppm)

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P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB20918 BRIDGE 1

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/14/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	103			
SURROGATE	#Dibromofluoromethane#	98.7			
SURROGATE	#Toluene-d8#	96.3			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0		1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB20918 BRIDGE 1

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/14/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0	5	1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

CAS# : Chemical Abstract Service Registry Number
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 ug / Kg : microgram / kilogram (ppb)
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Sample	AB20918	BRIDGE 1						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	17	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	3.1	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.27	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	170	µg/L	50		09/03/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	17	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	530	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	41	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	4.7	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1100	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	4.2	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	12	µg/L	10		08/22/2008	6020/200.8	KS
7440-42-8	Boron - Total	390	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	8300	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	2.6	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/14/2008	353.2	RA
7440-44-0	TOC	5.5	mg/L	0.5		08/12/2008	415.1	MB

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

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Sample Number: AB20919 H-209

Pesticides and PCBs

Analytical Method: 8081,8082
Extraction Method: 3510

Date Tested: 08/26/2008
Extraction Date: 08/12/2008

Analyst: MF
Qualifier:

Volume: 970

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	72.0			
SURROGATE	#Tetrachloro-m-xylene#	33.9			
72-54-8	4,4'-DDD	Not Detected	0.02		1.0
72-55-9	4,4'-DDE	Not Detected	0.02		1.0
50-29-3	4,4'-DDT	Not Detected	0.02		1.0
319-84-6	a-BHC	Not Detected	0.02		1.0
5103-71-9	a-Chlordane	Not Detected	0.01		1.0
309-00-2	Aldrin	Not Detected	0.01		1.0
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0
319-85-7	b-BHC	Not Detected	0.02		1.0
319-86-8	d-BHC	Not Detected	0.02		1.0
60-57-1	Dieldrin	Not Detected	0.02		1.0
959-98-8	Endosulfan I	Not Detected	0.02		1.0
33213-65-9	Endosulfan II	Not Detected	0.03		1.0
1031-07-8	Endosulfan sulfate	Not Detected	0.05		1.0
72-20-8	Endrin	Not Detected	0.02		1.0
7421-93-4	Endrin aldehyde	Not Detected	0.02		1.0
53494-70-5	Endrin ketone	Not Detected	0.02		1.0
58-89-9	g-BHC (Lindane)	Not Detected	0.02		1.0
5103-74-2	g-Chlordane	Not Detected	0.01		1.0
76-44-8	Heptachlor	Not Detected	0.01		1.0
1024-57-3	Heptachlor epoxide	Not Detected	0.01		1.0
87-82-1	Hexabromobenzene	Not Detected	0.02		1.0
72-43-5	Methoxychlor	Not Detected	0.05		1.0
2385-85-5	Mirex	Not Detected	0.02		1.0
59080-40-9	PBB (BP-6)	Not Detected	0.05		1.0
8001-35-2	Toxaphene	Not Detected	0.10		1.0

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Sample Number: AB20919 H-209

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/14/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	99.8			
SURROGATE	#Dibromofluoromethane#	101			
SURROGATE	#Toluene-d8#	98.6			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0		1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0		1.0
74-83-9	Bromomethane	Not Detected	5.0		1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
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Sample Number: AB20919 H-209

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 08/14/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0	5	1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

Base Neutral Acids with Library Search

Analytical Method: 8270 **Date Tested:** 08/25/2008 **Analyst:** SMH
Extraction Method: 3510 **Extraction Date:** 08/13/2008 **Qualifier:**

Volume: 980

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Organic Unit Mgr: Carol Smith
Systems Mgmt Unit: George Krisztian



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 Lansing, MI 48909
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 FAX: (517) 335-9600

Sample Number: AB20919 H-209

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 08/25/2008
Extraction Date: 08/13/2008

Analyst: SMH
Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	53.0			
SURROGATE	#2,4,6-Tribromophenol#	94.7			
SURROGATE	#2-Fluorophenol#	23.3			
SURROGATE	#Nitrobenzene - D5#	49.9			
SURROGATE	#Phenol - D6#	17.3			
SURROGATE	#p-Terphenyl-D14#	90.6			
	*Benzoic acid	3.8		LB	
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.1		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.1		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.1		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	26		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.1		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.1		1.0
95-51-2	2-Chloroaniline	Not Detected	5.1		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.1		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.1		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.1		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	26		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.1		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0

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 Lansing, MI 48909
 TEL: (517) 335-9800
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Sample Number: AB20919 H-209

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 08/25/2008
 Extraction Date: 08/13/2008

Analyst: SMH
 Qualifier:

Volume: 980

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
100-51-6	Benzyl Alcohol	Not Detected	51		1.0
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0		1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.1		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.1		1.0
86-74-8	Carbazole	Not Detected	5.1		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.1		1.0
84-66-2	Diethylphthalate	Not Detected	5.1		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.1		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.1		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.1		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.1		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0	8	1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.1		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.1		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0	8	1.0

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Sample	AB20919	H-209						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	309	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	309	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	55	mg/L	1	D	08/13/2008	325.2	LU
	Sulfate	4	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
CN_TOTAL	Cyanide	ND	mg/L	0.005		08/13/2008	9010/335.2	RG
	COD	32	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	8.6	mg N/L	0.5	I	08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	1.4	mg P/L	0.05	I	08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/21/2008	6020/200.8	KS
7440-36-0	Antimony - Total	1.5	µg/L	1		09/05/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	83	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	16000	µg/L	5	D	09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	17	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	27	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	1100	µg/L	5	D	08/22/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	14	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	120	µg/L	10		09/03/2008	6020/200.8	KS
7440-42-8	Boron - Total	680	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	26000	µg/L	200	D	09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	7.7	mg N/L	0.01		08/14/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.5	D	08/14/2008	353.2	RA
	Conductance	837	umhos/cm			08/14/2008	120.1	JB
	pH	6.75	pH			08/11/2008	150.1	TK
7440-44-0	TOC	11	mg/L	0.5		08/12/2008	415.1	MB
	Florisil Cleanup	Completed				08/20/2008	3620	DT
	Gel Permeation Cleanup	Completed				08/19/2008	3640	DT

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Sample	AB20920	H-50						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	272	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	272	mg/L	20	D	08/12/2008	310.2	LU
16887006	Chloride	21	mg/L	1		08/18/2008	325.2	LU
	Sulfate	3	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	14	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	1.1	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.14	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	ND	µg/L	50		08/21/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	28	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	310	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	2.0	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	690	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	3.0	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-22-4	Silver -Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/22/2008	6020/200.8	KS
7440-42-8	Boron - Total	770	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	14000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	1.1	mg N/L	0.01		08/19/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.1	D	08/19/2008	353.2	RA
	Conductance	605	umhos/cm			08/14/2008	120.1	JB
	pH	6.64	pH			08/11/2008	150.1	TK
7440-44-0	TOC	3.4	mg/L	0.5		08/12/2008	415.1	MB

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 Lansing, MI 48909
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 FAX: (517) 335-9600

Sample	AB20921	H-2						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
7429-90-5	Aluminium - Total	24000	µg/L	50	D	09/03/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	7.7	µg/L	1		09/03/2008	6020/200.8	LS
7440-39-3	Barium - Total	120	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	1.1	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	0.28	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	37	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	20	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	2300	µg/L	1	D	08/22/2008	6020/200.8	KS
7439-92-1	Lead - Total	48	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	510	µg/L	5		09/03/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	54	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		09/03/2008	6020/200.8	LS
7440-22-4	Silver - Total	7.5	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	82	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	150	µg/L	10		09/03/2008	6020/200.8	KS
7440-42-8	Boron - Total	110	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	13000	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG

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Sample	AB20922	W-72						
CAS#	Analyte Name	Result	Unit	RL	Qualifier	Date Tested	Method	Analyst
	Alkalinity - Bicarbonate	77	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity - Carbonate	ND	mg/L	10		08/18/2008	2320B SM	LU
	Alkalinity (as CaCO3)	77	mg/L	20		08/12/2008	310.2	LU
16887006	Chloride	2	mg/L	1		08/18/2008	325.2	LU
	Sulfate	2	mg/L	2		08/14/2008	375.2	LU
18540-29-9	Hexavalent Chromium	ND	µg/L	5	H	08/12/2008	7196	TK2
	COD	ND	mg/L	5		08/25/2008	410	MB
	Digestion Metals Water	Completed				08/19/2008	3010/200	TK2
	Digestion Mercury Water	Completed				08/19/2008	7470/245.1	TK2
7439-97-6	Mercury - Total	ND	µg/L	0.2		08/20/2008	7470/245.1	TS
	KN TP - Digestion	Completed				08/18/2008	351.2	DS1
TKN	Total Kjeldahl Nitrogen	.67	mg N/L	0.10		08/18/2008	351.2	DS1
7723-14-0	Total Phosphorus	.02	mg P/L	0.010		08/18/2008	365.4	DS1
7429-90-5	Aluminium - Total	88	µg/L	50		08/21/2008	6020/200.8	KS
7440-36-0	Antimony - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-38-2	Arsenic - Total	5.1	µg/L	1		08/21/2008	6020/200.8	KS
7440-39-3	Barium - Total	170	µg/L	5		09/03/2008	6020/200.8	KS
7440-41-7	Beryllium - Total	ND	µg/L	1		08/22/2008	6020/200.8	KS
7440-43-9	Cadmium - Total	ND	µg/L	0.2		08/22/2008	6020/200.8	KS
7440-47-3	Chromium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-48-4	Cobalt - Total	ND	µg/L	15		08/21/2008	6020/200.8	KS
7440-50-8	Copper - Total	74	µg/L	1		08/21/2008	6020/200.8	KS
7439-92-1	Lead - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7439-96-5	Manganese - Total	27	µg/L	5		08/21/2008	6020/200.8	KS
7439-98-7	Molybdenum - Total	ND	µg/L	25		08/22/2008	6020/200.8	KS
7440-02-0	Nickel - Total	ND	µg/L	2.0		08/21/2008	6020/200.8	KS
7782-49-2	Selenium - Total	ND	µg/L	1		08/21/2008	6020/200.8	KS
7440-22-4	Silver - Total	ND	µg/L	0.2		08/21/2008	6020/200.8	KS
7440-28-0	Thallium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-62-2	Vanadium - Total	ND	µg/L	2		08/21/2008	6020/200.8	KS
7440-66-6	Zinc - Total	ND	µg/L	10		08/22/2008	6020/200.8	KS
7440-42-8	Boron - Total	52	µg/L	20		09/02/2008	6010/200.7	EG
7439-89-6	Iron - Total	71	µg/L	20		09/02/2008	6010/200.7	EG
7439-93-2	Lithium - Total	ND	µg/L	10		09/02/2008	6010/200.7	EG
7664-41-7	Ammonia	.43	mg N/L	0.01		08/19/2008	350.1	RA
7727-37-9	Nitrate + Nitrite	ND	mg N/L	0.01		08/19/2008	353.2	RA
	Conductance	182	umhos/cm			08/14/2008	120.1	JB
	pH	8.36	pH			08/11/2008	150.1	TK
7440-44-0	TOC	.5	mg/L	0.5		08/12/2008	415.1	MB

CAS# : Chemical Abstract Service Registry Number

RL : Reporting Limit

ND : Not Detected

ug / L : microgram / liter (ppb)

mg / L : milligram / liter (ppm)

ug / Kg : microgram / kilogram (ppb)

mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts

Inorganic Unit Mgr: Sandy Gregg

Organic Unit Mgr: Carol Smith

Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

<u>Qualifier Code</u>	<u>Qualifier Description</u>
1	Result(s) and RL(s) are estimated due to low surrogate recovery.
2	Result is estimated due to high surrogate recovery.
3	Result(s) and RL(s) are estimated due to low matrix spike recovery.
4	Result is estimated due to high matrix spike recovery.
5	Result and RL are estimated due to low continuing calibration standard criteria failure.
6	Result is estimated due to high continuing calibration standard criteria failure.
7	Result(s) and RL(s) are estimated due to poor precision.
8	Result(s) and RL(s) are estimated due to low recovery of batch QC.
9	Result outside QC acceptance criteria.
A	Value reported is the mean of two or more determinations.
C	Value calculated from other independent parameters.
D	Analyte value quantified from a dilution(s); reporting limit (RL) raised.
E	Result is estimated due to high recovery of batch QC.
F	Amenable cyanide was not analyzed due to low level of total cyanide.
G	Result and RL are estimated due to initial calibration standard criteria failure.
H	Recommended laboratory holding time was exceeded.
I	Dilution required due to matrix interference; reporting limit (RL) raised.
J	Analyte was positively identified. Value is an estimate.
JA	Result is estimated due to multiple Aroclors present.
JC	Result is estimated since confirmation analysis did not meet acceptance criteria
JD	Due to severe degradation, specific Aroclor identification is difficult and quantitation is estimated.
K	RL(s) raised due to matrix interferences.
KR	RL(s) raised due to low sample volume submitted.
KS	RL(s) raised due to low total solids.
KW	RL(s) raised due to light sample weight.
LB	Reported library search compounds are tentative identifications with estimated concentrations.
M	The level of the method preparation blank (MPB) is reported in the qualifier column.
N	Non-homogeneous sample made analysis of sample questionable.
O	Result and RL estimated due to analysis from an open vial.
P	Recommended sample collection/preservation technique not used; reported result(s) is an estimate.
Q	Quantity of sample insufficient to perform analyses requested.
R	Result confirmed by re-extraction and analysis.
S	Supernatant analyzed.
T	Reported value is less than the reporting limit (RL). Result is estimated.
V	Value not available due to dilution.
W	Reported value is less than the method detection limit (MDL).
X	Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200°C. 2-Methylnaphthalene & naphthalene have boiling points above 200°C and are better suited to analysis by methods 8270 or 625 as semivolatile organics.
PI	Possible interference may have affected the accuracy of the laboratory result
Z	Result reported below the RL to meet the TDL in RRD Op Memo 2 (10/22/04) multiplied by applicable dilution factor.

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
BRIDGE 1, Collected: 8/8/2008-20:40			ug/L	ug/L	ug/L	ug/L	ug/L
Metals							
Aluminum (B)	170	T ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T ug/L	6	6	130	2	68,000
Arsenic	17	T ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	530	T ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T ug/L	4	4	(2) 0.41		290,000
Boron (B)	390	T ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T ug/L	5	5	1.3	1.3	190,000
Chromium (with Cr VI criteria)	< 1	T ug/L	100	100	11		460,000
Cobalt	< 15	T ug/L	40	100	100		2.4E+6
Copper (B)	41	T ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	8,300	T ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	4.7	T ug/L	(1) 4	(1) 4	4.8	4.8	ID
Lithium (B)	< 10	T ug/L	170	350	96		5.4E+6
Manganese (B)	1,100	T ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T ug/L	73	210	800	120	970,000
Nickel (B)	4.2	T ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T ug/L	50	50	5		970,000
Silver (B)	< 0.2	T ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T ug/L	4.5	62	12		970,000
Zinc (B)	12	T ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms							
Ammonia	2,600	T ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	20	T ug/L			53		
Nitrogen	3,100	T ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT		UNITS					
BRIDGE 1, Collected: 8/8/2008-20:40				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	270	T	ug/L	63,000	240,000	1,000		ID
<i>Semivolatiles</i>								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
<i>Semivolatiles, PNAs</i>								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
<i>Volatiles</i>								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
BRIDGE 1, Collected: 8/8/2008-20:40			ug/L	ug/L	ug/L	ug/L	ug/L
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
BRIDGE 1, Collected: 8/8/2008-20:40				ug/L	ug/L	ug/L	ug/L	ug/L
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	5.2	T	ug/L	10	10	150	50	4,300
Barium (B)	760	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	330	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium (with Cr VI criteria)	< 1	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	1.6	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	6,300	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Manganese (B)	770	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	2.8	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Nitrite (B,N)	< 10	T	ug/L	1,000	1,000	NA		ID
Nitrogen	< 10	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
BW, Collected: 10/14/2008-11:23			ug/L	ug/L	ug/L	ug/L	ug/L
sec-Butylbenzene	< 1	T ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T ug/L	80	230	ID		5,900
tert-Butylbenzene (I)	< 1	T ug/L	80	230	ID		8,900
Carbon disulfide (I,R)	< 1	T ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T ug/L	5	5	45	5.6	4,600
Chlorobenzene (I)	< 1	T ug/L	100	100	47		86,000
Chloroethane	< 5	T ug/L	430	1,700	ID		440,000
Chloromethane (I)	< 5	T ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
BW, Collected: 10/14/2008-11:23				ug/L	ug/L	ug/L	ug/L	ug/L
Methylene chloride	< 5	T	ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T	ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T	ug/L	80	230	ID		15,000
Styrene	< 1	T	ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T	ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T	ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T	ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T	ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T	ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T	ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T	ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	7.7	T	ug/L	10	10	150	50	4,300
Barium (B)	18,000	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	540	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	3.9	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	50,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	1.1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,600	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	22	T	ug/L	100	100	29		7.4E+7
Selenium (B)	1.1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	15	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	22,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	170	T	ug/L			(1) 53		
Nitrogen	23,000	T	ug/L	(1) 10,000	(1) 10,000			
Nonspecific Grouping								
Chloride	60,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	ug/L					
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Phosphorus, Total	1,500	T	ug/L	63,000	240,000	(1) 1,000		ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T	ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T	ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T	ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T	ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (l)	< 1	T	ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T	ug/L	70	70	620		200,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-101, Collected: 8/7/2008-10:07			ug/L	ug/L	ug/L	ug/L	ug/L
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T ug/L	72	72	45		61,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-101, Collected: 8/7/2008-10:07				ug/L	ug/L	ug/L	ug/L	ug/L
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	30	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	22,000	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	580	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	7	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	9.3	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	37,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	14	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,000	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	39	T	ug/L	100	100	(1) 29		7.4E+7
Selenium (B)	1	T	ug/L	50	50	5		970,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	83	T	ug/L	2,400	5,000	(1) 66		1.1E+8
Nitrogen Forms								
Ammonia	18,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	140	T	ug/L			(1) 53		
Nitrogen	20,000	T	ug/L	(1) 10,000	(1) 10,000			
Nonspecific Grouping								
Chloride	55,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	1,200	T	ug/L	63,000	240,000	(1) 1,000		ID
Sulfate	20,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	1.5	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-104, Collected: 8/7/2008-11:27			ug/L	ug/L	ug/L	ug/L	ug/L
Chloromethane (I)	< 5	T ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	1.6	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-104, Collected: 8/7/2008-11:27				ug/L	ug/L	ug/L	ug/L	ug/L
Tetrahydrofuran	< 5	T	ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T	ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T	ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T	ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (l)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	34	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	710	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	1,200	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	8	T	ug/L	100	100	11		460,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	1.2	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	20,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,800	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	3.7	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	11	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	7,800	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	60	T	ug/L			(1) 53		
Nitrogen	8,200	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	35,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	680	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-16, Collected: 8/7/2008-16:31				ug/L	ug/L	ug/L	ug/L	ug/L
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-16, Collected: 8/7/2008-16:31			ug/L	ug/L	ug/L	ug/L	ug/L
Bromomethane	< 5	T ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T ug/L	3,900	11,000	NA		7.9E+7
n-Butylbenzene	< 1	T ug/L	80	230	ID		5,900
sec-Butylbenzene	< 1	T ug/L	80	230	ID		4,400
tert-Butylbenzene (l)	< 1	T ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T ug/L	100	100	47		86,000
Chloroethane	< 5	T ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (l)	< 1	T ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
1,1-Dichloroethylene (l)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (l)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (l)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					
H-16, Collected: 8/7/2008-16:31			ug/L	ug/L	ug/L	ug/L	ug/L
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T ug/L	72	72	45		61,000
Vinyl chloride	< 1	T ug/L	2	2	15		1,000
Xylenes (l)	< 2	T ug/L	280	280	35		190,000
Volatiles, Trihalomethanes							
Bromodichloromethane	< 1	T ug/L	80	80	ID		14,000
Bromoform	< 1	T ug/L	80	80	ID		140,000
Chloroform	< 1	T ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T ug/L	80	80			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-2, Collected: 8/6/2008-13:30			ug/L	ug/L	ug/L	ug/L	ug/L
Metals							
Aluminum (B)	24,000	T ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T ug/L	6	6	130	2	68,000
Arsenic	7.7	T ug/L	10	10	150	50	4,300
Barium (B)	120	T ug/L	2,000	2,000	210	210	1.4E+7
Beryllium	1.1	T ug/L	4	4	(1) 0.41		290,000
Boron (B)	110	T ug/L	500	500	1,900		6.2E+7
Cadmium (B)	0.28	T ug/L	5	5	1.3	1.3	190,000
Chromium (with Cr VI criteria)	37	T ug/L	100	100	(1) 11		460,000
Cobalt	20	T ug/L	40	100	100		2.4E+6
Copper (B)	2,300	T ug/L	(1) 1,000	(1) 1,000	(1) 5		7.4E+6
Iron (B)	13,000	T ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	48	T ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T ug/L	170	350	96		5.4E+6
Manganese (B)	510	T ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T ug/L	73	210	800	120	970,000
Nickel (B)	54	T ug/L	100	100	(1) 29		7.4E+7
Selenium (B)	< 1	T ug/L	50	50	5		970,000
Silver (B)	7.5	T ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T ug/L	2	2	3.7	2	13,000
Vanadium	82	T ug/L	(1) 4.5	(1) 62	(1) 12		970,000
Zinc (B)	150	T ug/L	2,400	5,000	(1) 66		1.1E+8
H-209, Collected: 8/8/2008-09:18			ug/L	ug/L	ug/L	ug/L	ug/L
Metals							
Aluminum (B)	< 50	T ug/L	50	50	NA		6.4E+7
Antimony	1.5	T ug/L	6	6	130	2	68,000
Arsenic	83	T ug/L	(1) 10	(1) 10	150	(1) 50	4,300

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Barium (B)	16,000	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	680	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	17	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	26,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	27	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,100	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	14	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	120	T	ug/L	2,400	5,000	(1) 66		1.1E+8
Nitrogen Forms								
Ammonia	7,700	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	59	T	ug/L			(1) 53		
Nitrogen	8,600	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	55,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	1,400	T	ug/L	63,000	240,000	(1) 1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T	ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T	ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T	ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T	ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (l)	< 1	T	ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T	ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T	ug/L	70	70	620		200,000
1,1-Dichloroethylene (l)	< 1	T	ug/L	7	7	65	24	11,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-209, Collected: 8/8/2008-09:18			ug/L	ug/L	ug/L	ug/L	ug/L
1,2-Dichloropropane (l)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (l)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T ug/L	72	72	45		61,000
Vinyl chloride	< 1	T ug/L	2	2	15		1,000
Xylenes (l)	< 2	T ug/L	280	280	35		190,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-209, Collected: 8/8/2008-09:18				ug/L	ug/L	ug/L	ug/L	ug/L
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	6,100	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	49	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	1,200	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	360	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	7	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	3,800	T	ug/L	(1) 1,000	(1) 1,000	(1) 5		7.4E+6
Iron (B)	15,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	22	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,900	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	22	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	4.3	T	ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
Vanadium	30	T	ug/L	(1) 4.5	62	(1) 12		970,000
Zinc (B)	52	T	ug/L	2,400	5,000	66		1.1E+8
<i>Nitrogen Forms</i>								
Ammonia	1,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	8.5	T	ug/L			53		
Nitrogen	1,300	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	52,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	170	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
<i>PCBs</i>								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
<i>Pesticides, Chlorinated</i>								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (I)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (I)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (I)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (I)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (I)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (I)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (I,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (I)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (I)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-22, Collected: 8/7/2008-16:03			ug/L	ug/L	ug/L	ug/L	ug/L
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T ug/L	790	790	140		530,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-22, Collected: 8/7/2008-16:03				ug/L	ug/L	ug/L	ug/L	ug/L
1,2,4-Trichlorobenzene	< 5	T	ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T	ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-225, Collected: 8/8/2008-08:48				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	12	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	2,600	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	980	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	13	T	ug/L	1,000	1,000	(1) 5		7.4E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-225, Collected: 8/8/2008-08:48				ug/L	ug/L	ug/L	ug/L	ug/L
Iron (B)	6,500	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	6.4	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,900	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	4.4	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	1,400	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	11	T	ug/L			53		
Nitrogen	1,800	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	22,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-225, Collected: 8/8/2008-08:48				ug/L	ug/L	ug/L	ug/L	ug/L
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (I)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (I)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (I)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (I)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (I)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-225, Collected: 8/8/2008-08:48			ug/L	ug/L	ug/L	ug/L	ug/L
t-Butyl alcohol	< 50	T ug/L	3,900	11,000	NA		7.9E+7
n-Butylbenzene	< 1	T ug/L	80	230	ID		5,900
sec-Butylbenzene	< 1	T ug/L	80	230	ID		4,400
tert-Butylbenzene (I)	< 1	T ug/L	80	230	ID		8,900
Carbon disulfide (I,R)	< 1	T ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T ug/L	5	5	45	5.6	4,600
Chlorobenzene (I)	< 1	T ug/L	100	100	47		86,000
Chloroethane	< 5	T ug/L	430	1,700	ID		440,000
Chloromethane (I)	< 5	T ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
H-225, Collected: 8/8/2008-08:48			ug/L	ug/L	ug/L	ug/L	ug/L
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T ug/L	72	72	45		61,000
Vinyl chloride	< 1	T ug/L	2	2	15		1,000
Xylenes (l)	< 2	T ug/L	280	280	35		190,000
Volatiles, Trihalomethanes							
Bromodichloromethane	< 1	T ug/L	80	80	ID		14,000
Bromoform	< 1	T ug/L	80	80	ID		140,000
Chloroform	< 1	T ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T ug/L	80	80			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	7.8	T	ug/L	10	10	150	50	4,300
Barium (B)	380	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	240	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	9.7	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	2,500	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	410	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	< 2	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	3,600	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	28	T	ug/L			53		
Nitrogen	4,000	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	40,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	350	T	ug/L	63,000	240,000	1,000		ID
Sulfate	3,000	T	ug/L	250,000	250,000	NA		ID
<i>PCBs</i>								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
<i>Pesticides, Chlorinated</i>								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
<i>Semivolatiles</i>								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T	ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T	ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T	ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T	ug/L	880	2,500	740		2.4E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					
H-29, Collected: 8/7/2008-15:16			ug/L	ug/L	ug/L	ug/L	ug/L
1,2-Dichloroethane (l)	< 1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (l)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (l)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (l)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-29, Collected: 8/7/2008-15:16				ug/L	ug/L	ug/L	ug/L	ug/L
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	28	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	310	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	770	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	2	T	ug/L	1,000	1,000	5		7.4E+6
Iron (B)	14,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	690	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
H-50, Collected: 8/8/2008-11:45				ug/L	ug/L	ug/L	ug/L	ug/L
Nickel (B)	3	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	1,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	8.5	T	ug/L			53		
Nitrogen	1,100	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	21,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	140	T	ug/L	63,000	240,000	1,000		ID
Sulfate	3,000	T	ug/L	250,000	250,000	NA		ID
H-59, Collected: 8/8/2008-16:07				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	52	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	15	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	430	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	630	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	54	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	15,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
H-59, Collected: 8/8/2008-16:07				ug/L	ug/L	ug/L	ug/L	ug/L
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,600	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	3	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	8,900	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	69	T	ug/L			(1) 53		
Nitrogen	9,500	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	30,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	1,000	T	ug/L	63,000	240,000	1,000		ID
Sulfate	4,000	T	ug/L	250,000	250,000	NA		ID
H-70, Collected: 8/8/2008-19:30				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	3	T	ug/L	10	10	150	50	4,300
Barium (B)	590	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	140	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
H-70, Collected: 8/8/2008-19:30				ug/L	ug/L	ug/L	ug/L	ug/L
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	16	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	17,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	860	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	5.6	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	1,200	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	9.2	T	ug/L			53		
Nitrogen	1,700	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	620,000	T	ug/L	(1) 250,000	(1) 250,000	(1) 50,000	(1) 50,000	ID
Phosphorus, Total	< 10	T	ug/L	63,000	240,000	1,000		ID
Sulfate	25,000	T	ug/L	250,000	250,000	NA		ID
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	96	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	2.5	T	ug/L	10	10	150	50	4,300
Barium (B)	11,000	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	600	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	5.3	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	81,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	3,700	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	15	T	ug/L	100	100	29		7.4E+7
Selenium (B)	3.4	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	72,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	550	T	ug/L			(1) 53		
Nitrogen	76,000	T	ug/L	(1) 10,000	(1) 10,000			
Nonspecific Grouping								
Chloride	56,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	2,000	T	ug/L	63,000	240,000	(1) 1,000		ID
Sulfate	22,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T	ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T	ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T	ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T	ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (l)	< 1	T	ug/L	5	5	360	6	19,000
trans-1,2-Dichloroethylene	< 1	T	ug/L	100	100	1,500		220,000
cis-1,2-Dichloroethylene	< 1	T	ug/L	70	70	620		200,000
1,1-Dichloroethylene (l)	< 1	T	ug/L	7	7	65	24	11,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
W-16E, Collected: 8/7/2008-10:03			ug/L	ug/L	ug/L	ug/L	ug/L
1,2-Dichloropropane (l)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (l)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T ug/L	72	72	45		61,000
Vinyl chloride	< 1	T ug/L	2	2	15		1,000
Xylenes (l)	< 2	T ug/L	280	280	35		190,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-16E, Collected: 8/7/2008-10:03				ug/L	ug/L	ug/L	ug/L	ug/L
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	1.4	T	ug/L	6	6	130	2	68,000
Arsenic	44	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	28,000	T	ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	690	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	7	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	64	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	54,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	21	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	12	T	ug/L	170	350	96		5.4E+6
Manganese (B)	3,100	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	34	T	ug/L	100	100	(1) 29		7.4E+7
Selenium (B)	1.8	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	63	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	80,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	620	T	ug/L			(1) 53		
Nitrogen	83,000	T	ug/L	(1) 10,000	(1) 10,000			
Nonspecific Grouping								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	2,400	T	ug/L	63,000	240,000	(1) 1,000		ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.11	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.11	T	ug/L	3	3	1		44
Volatiles								
Acetone (I)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (I)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (I)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (I)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (I)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
tert-Butylbenzene (I)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (I,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (I)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (I)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
W-16L, Collected: 8/7/2008-09:25			ug/L	ug/L	ug/L	ug/L	ug/L
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T ug/L	790	790	140		530,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-16L, Collected: 8/7/2008-09:25				ug/L	ug/L	ug/L	ug/L	ug/L
1,2,4-Trichlorobenzene	< 5	T	ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T	ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	2.1	T	ug/L	6	6	130	(1) 2	68,000
Arsenic	25	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	750	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	750	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	780	T	ug/L	1,000	1,000	(1) 5		7.4E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS	ug/L					
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
Iron (B)	< 20	T	ug/L	300	300	NA		5.8E+7
Lead (B)	5.2	T	ug/L	(1) 4	(1) 4	(1) 4.8	(1) 4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	480	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	4.2	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	0.22	T	ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	4.4	T	ug/L	4.5	62	12		970,000
Zinc (B)	12	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	64,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	490	T	ug/L			(1) 53		
Nitrogen	67,000	T	ug/L	(1) 10,000	(1) 10,000			
Nonspecific Grouping								
Chloride	46,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	< 500	T	ug/L	63,000	240,000	1,000		ID
Sulfate	6,000	T	ug/L	250,000	250,000	NA		ID
PCBs								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
Pesticides, Chlorinated								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-33, Collected: 8/7/2008-13:02				ug/L	ug/L	ug/L	ug/L	ug/L
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (I)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (I)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (I)	< 1	T	ug/L	5	5	200	12	11,000
Bromobenzene (I)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (I)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
W-33, Collected: 8/7/2008-13:02			ug/L	ug/L	ug/L	ug/L	ug/L
t-Butyl alcohol	< 50	T ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T ug/L	80	230	ID		5,900
tert-Butylbenzene (I)	< 1	T ug/L	80	230	ID		8,900
Carbon disulfide (I,R)	< 1	T ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T ug/L	5	5	45	5.6	4,600
Chlorobenzene (I)	< 1	T ug/L	100	100	47		86,000
Chloroethane	< 5	T ug/L	430	1,700	ID		440,000
Chloromethane (I)	< 5	T ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T ug/L	600	600	16		160,000
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	< 1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
W-33, Collected: 8/7/2008-13:02			ug/L	ug/L	ug/L	ug/L	ug/L
4-Methyl-2-pentanone (MIBK) (l)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (l)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (l)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6
1,1,2-Trichloroethane	< 1	T ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (l)	< 1	T ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (l)	< 1	T ug/L	72	72	45		61,000
Vinyl chloride	< 1	T ug/L	2	2	15		1,000
Xylenes (l)	< 2	T ug/L	280	280	35		190,000
Volatiles, Trihalomethanes							
Bromodichloromethane	< 1	T ug/L	80	80	ID		14,000
Bromoform	< 1	T ug/L	80	80	ID		140,000
Chloroform	< 1	T ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T ug/L	80	80			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-38, Collected: 8/7/2008-17:42				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	2.6	T	ug/L	10	10	150	50	4,300
Barium (B)	710	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	160	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	0.95	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	440	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	47	T	ug/L	300	300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	1,100	T	ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	4.1	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	0.42	T	ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	3.6	T	ug/L	4.5	62	12		970,000
Zinc (B)	26	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	4,500	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	35	T	ug/L			53		
Nitrogen	4,900	T	ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-38, Collected: 8/7/2008-17:42				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	80,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	8,000	T	ug/L	250,000	250,000	NA		ID
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	48	T	ug/L	(1) 10	(1) 10	150	50	4,300
Barium (B)	350	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	58	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	29	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	39,000	T	ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	730	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	2.3	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nitrogen Forms</i>								
Ammonia	17,000	T	ug/L	(1) 10,000	(1) 10,000			ID
Ammonia, Unionized, Warm Bod	130	T	ug/L			(1) 53		
Nitrogen	18,000	T	ug/L	(1) 10,000	(1) 10,000			
<i>Nonspecific Grouping</i>								
Chloride	67,000	T	ug/L	250,000	250,000	(1) 50,000	(1) 50,000	ID
Cyanide, Total (P,R)	< 5	T	ug/L	200	200	5.2		57,000
Phosphorus, Total	150	T	ug/L	63,000	240,000	1,000		ID
Sulfate	43,000	T	ug/L	250,000	250,000	NA		ID
<i>PCBs</i>								
Polychlorinated biphenyls (J,T)	< 0.1	T	ug/L	0.5	0.5	0.2		3.3
<i>Pesticides, Chlorinated</i>								
Aldrin	< 0.01	T	ug/L	0.098	0.4	0.01		0.34
Chlordane (J)	< 0.01	T	ug/L	2	2	NA		15
4-4 -DDD	< 0.02	T	ug/L	9.1	37	NA		44
4-4 -DDE	< 0.02	T	ug/L	4.3	15	NA		27
4-4 -DDT	< 0.02	T	ug/L	3.6	10	0.02		13
Dieldrin	< 0.02	T	ug/L	0.11	0.43	0.02		2.4
Endosulfan (J)	< 0.03	T	ug/L	44	130	0.03		510
Endrin	< 0.02	T	ug/L	2	2	NA		160
Heptachlor	< 0.01	T	ug/L	0.4	0.4	0.01	0.01	2.9
Heptachlor epoxide	< 0.01	T	ug/L	0.2	0.2	ID		9
Hexabromobenzene	< 0.02	T	ug/L	0.17	0.17	ID		0.17
alpha-Hexachlorocyclohexane	< 0.02	T	ug/L	0.43	1.7	NA		60
beta-Hexachlorocyclohexane	< 0.02	T	ug/L	0.88	3.6	ID	0.024	120
Lindane	< 0.02	T	ug/L	0.2	0.2	0.03		190
Methoxychlor	< 0.05	T	ug/L	40	40	NA		45
Mirex	< 0.02	T	ug/L	0.02	0.02	0.02	0.02	0.02

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results								
PARAMETER	RESULT	UNITS						
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
Polybrominated biphenyls (J)	< 0.05	T	ug/L	(2) 0.03	0.09	NA		ID
Semivolatiles								
Hexachloroethane	< 5	T	ug/L	7.3	21	6.7	5.3	1,900
Naphthalene	< 5	T	ug/L	520	1,500	13		31,000
Semivolatiles, PNAs								
2-Methylnaphthalene	< 5	T	ug/L	260	750	ID		25,000
Toxaphene								
Toxaphene	< 0.1	T	ug/L	3	3	1		44
Volatiles								
Acetone (l)	< 20	T	ug/L	730	2,100	1,700		3.1E+7
Acrylonitrile (l)	< 5	T	ug/L	(2) 2.6	11	(2) 4.9	(2) 2	14,000
t-Amyl methyl ether (TAME)	< 5	T	ug/L	190	190	NA		2.6E+6
Benzene (l)	11	T	ug/L	(1) 5	(1) 5	200	12	11,000
Bromobenzene (l)	< 1	T	ug/L	18	50	NA		12,000
Bromomethane	< 5	T	ug/L	10	29	35		70,000
2-Butanone (MEK) (l)	< 5	T	ug/L	13,000	38,000	2,200		2.4E+8
t-Butyl alcohol	< 50	T	ug/L	3,900	11,000	NA		7.9E+7
sec-Butylbenzene	< 1	T	ug/L	80	230	ID		4,400
n-Butylbenzene	< 1	T	ug/L	80	230	ID		5,900
tert-Butylbenzene (l)	< 1	T	ug/L	80	230	ID		8,900
Carbon disulfide (l,R)	< 1	T	ug/L	800	2,300	ID		1.2E+6
Carbon tetrachloride	< 1	T	ug/L	5	5	45	5.6	4,600
Chlorobenzene (l)	< 1	T	ug/L	100	100	47		86,000
Chloroethane	< 5	T	ug/L	430	1,700	ID		440,000
Chloromethane (l)	< 5	T	ug/L	260	1,100	ID		490,000
Dibromochloropropane	< 5	T	ug/L	(2) 0.2	(2) 0.2	NA		390
Dibromomethane	< 1	T	ug/L	80	230	NA		530,000
1,2-Dichlorobenzene	< 1	T	ug/L	600	600	16		160,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					
W-43, Collected: 8/7/2008-11:25			ug/L	ug/L	ug/L	ug/L	ug/L
1,3-Dichlorobenzene	< 1	T ug/L	6.6	19	38		2,000
1,4-Dichlorobenzene	< 1	T ug/L	75	75	13		6,400
Dichlorodifluoromethane	< 5	T ug/L	1,700	4,800	ID		300,000
1,1-Dichloroethane	< 1	T ug/L	880	2,500	740		2.4E+6
1,2-Dichloroethane (I)	4.1	T ug/L	5	5	360	6	19,000
cis-1,2-Dichloroethylene	< 1	T ug/L	70	70	620		200,000
trans-1,2-Dichloroethylene	< 1	T ug/L	100	100	1,500		220,000
1,1-Dichloroethylene (I)	< 1	T ug/L	7	7	65	24	11,000
1,2-Dichloropropane (I)	< 1	T ug/L	5	5	290	9.1	16,000
1,3-Dichloropropene	< 1	T ug/L	8.5	35	NA		5,500
Diethyl ether	< 5	T ug/L	10	10	ID		3.5E+7
Diisopropyl ether	< 5	T ug/L	30	86	ID		8,000
Ethylbenzene (I)	< 1	T ug/L	74	74	18		170,000
Ethylene dibromide	< 1	T ug/L	(2) 0.05	(2) 0.05	(2) 0.2	(2) 0.05	25
Ethyl-tert-butyl ether (ETBE)	< 5	T ug/L	49	49	NA		ID
2-Hexanone	< 5	T ug/L	1,000	2,900	NA		5.2E+6
Isopropyl benzene	< 1	T ug/L	800	2,300	ID		56,000
4-Methyl-2-pentanone (MIBK) (I)	< 5	T ug/L	1,800	5,200	ID		1.3E+7
Methylene chloride	< 5	T ug/L	5	5	940	47	220,000
Methyl-tert-butyl ether (MTBE)	< 1	T ug/L	40	40	730	100	610,000
n-Propylbenzene (I)	< 1	T ug/L	80	230	ID		15,000
Styrene	< 1	T ug/L	100	100	80		9,700
1,1,1,2-Tetrachloroethane	< 1	T ug/L	77	320	ID (X)	19	30,000
1,1,2,2-Tetrachloroethane	< 1	T ug/L	8.5	35	78	3.2	4,700
Tetrachloroethylene	< 1	T ug/L	5	5	45	11	12,000
Tetrahydrofuran	< 5	T ug/L	95	270	11,000	350	1.6E+6
Toluene (I)	< 1	T ug/L	790	790	140		530,000
1,2,4-Trichlorobenzene	< 5	T ug/L	70	70	30		19,000
1,1,1-Trichloroethane	< 1	T ug/L	200	200	200		1.3E+6

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-43, Collected: 8/7/2008-11:25				ug/L	ug/L	ug/L	ug/L	ug/L
1,1,2-Trichloroethane	< 1	T	ug/L	5	5	330	12	21,000
Trichloroethylene	< 1	T	ug/L	5	5	200	29	22,000
Trichlorofluoromethane	< 1	T	ug/L	2,600	7,300	NA		1.1E+6
1,2,3-Trichloropropane	< 1	T	ug/L	42	120	NA		84,000
1,2,4-Trimethylbenzene (I)	< 1	T	ug/L	63	63	17		56,000
1,3,5-Trimethylbenzene (I)	< 1	T	ug/L	72	72	45		61,000
Vinyl chloride	< 1	T	ug/L	2	2	15		1,000
Xylenes (I)	< 2	T	ug/L	280	280	35		190,000
Volatiles, Trihalomethanes								
Bromodichloromethane	< 1	T	ug/L	80	80	ID		14,000
Bromoform	< 1	T	ug/L	80	80	ID		140,000
Chloroform	< 1	T	ug/L	80	80	170	77	150,000
Dibromochloromethane	< 1	T	ug/L	80	80	ID		18,000
Trihalomethanes	< 1	T	ug/L	80	80			
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	64	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	< 1	T	ug/L	10	10	150	50	4,300
Barium (B)	740	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	1,400	T	ug/L	(1) 500	(1) 500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	230	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	56	T	ug/L	300	300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-55, Collected: 8/8/2008-11:46				ug/L	ug/L	ug/L	ug/L	ug/L
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	490	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	4.4	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	0.21	T	ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	2.5	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	8,100	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	62	T	ug/L			(1) 53		
Nitrogen	8,500	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	49,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	< 50	T	ug/L	63,000	240,000	1,000		ID
Sulfate	27,000	T	ug/L	250,000	250,000	NA		ID
W-72, Collected: 8/8/2008-00:00				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	88	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	5.1	T	ug/L	10	10	150	50	4,300
Barium (B)	170	T	ug/L	2,000	2,000	210	210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	52	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-72, Collected: 8/8/2008-00:00				ug/L	ug/L	ug/L	ug/L	ug/L
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	74	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	71	T	ug/L	300	300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	27	T	ug/L	50	50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	< 2	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	430	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	3.3	T	ug/L			53		
Nitrogen	670	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	2,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID
W-73, Collected: 8/8/2008-17:00				ug/L	ug/L	ug/L	ug/L	ug/L
Metals								
Aluminum (B)	< 50	T	ug/L	50	50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	2.8	T	ug/L	10	10	150	50	4,300
Barium (B)	89	T	ug/L	2,000	2,000	210	210	1.4E+7

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-73, Collected: 8/8/2008-17:00				ug/L	ug/L	ug/L	ug/L	ug/L
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	45	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	35	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	20	T	ug/L	300	300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	39	T	ug/L	50	50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	< 2	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	< 0.2	T	ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms								
Ammonia	510	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	3.9	T	ug/L			53		
Nitrogen	560	T	ug/L	10,000	10,000			
Nonspecific Grouping								
Chloride	3,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	10	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
D in units indicate dissolved results							
PARAMETER	RESULT	UNITS					
W-76, Collected: 8/8/2008-17:40			ug/L	ug/L	ug/L	ug/L	ug/L
Metals							
Aluminum (B)	830	T ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 10	T ug/L	(2) 6	(2) 6	130	(2) 2	68,000
Arsenic	10	T ug/L	10	10	150	50	4,300
Barium (B)	17,000	T ug/L	(1) 2,000	(1) 2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 10	T ug/L	(2) 4	(2) 4	(2) 0.41		290,000
Boron (B)	86	T ug/L	500	500	1,900		6.2E+7
Cadmium (B)	2.5	T ug/L	5	5	(1) 1.3	(1) 1.3	190,000
Chromium VI	5	T ug/L	100	100	11		460,000
Cobalt	< 15	T ug/L	40	100	100		2.4E+6
Copper (B)	13,000	T ug/L	(1) 1,000	(1) 1,000	(1) 5		7.4E+6
Iron (B)	11,000	T ug/L	(1) 300	(1) 300	NA		5.8E+7
Lead (B)	1.1	T ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T ug/L	170	350	96		5.4E+6
Manganese (B)	12,000	T ug/L	(1) 50	(1) 50	(1) 1,000	(1) 1,000	9.1E+6
Mercury, Total	< 0.2	T ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T ug/L	73	210	800	120	970,000
Nickel (B)	150	T ug/L	(1) 100	(1) 100	(1) 29		7.4E+7
Selenium (B)	< 10	T ug/L	50	50	(2) 5		970,000
Silver (B)	< 0.2	T ug/L	34	98	0.2		1.5E+6
Thallium (B)	< 2	T ug/L	2	2	3.7	2	13,000
Vanadium	< 10	T ug/L	(2) 4.5	62	12		970,000
Zinc (B)	47	T ug/L	2,400	5,000	66		1.1E+8
Nitrogen Forms							
Ammonia	1,300	T ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	10	T ug/L			53		
Nitrogen	3,000	T ug/L	10,000	10,000			

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS						
W-76, Collected: 8/8/2008-17:40				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nonspecific Grouping</i>								
Chloride	4,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	20	T	ug/L	63,000	240,000	1,000		ID
Sulfate	2,000	T	ug/L	250,000	250,000	NA		ID
W-78, Collected: 8/8/2008-18:26				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Metals</i>								
Aluminum (B)	73	T	ug/L	(1) 50	(1) 50	NA		6.4E+7
Antimony	< 1	T	ug/L	6	6	130	2	68,000
Arsenic	2.1	T	ug/L	10	10	150	50	4,300
Barium (B)	230	T	ug/L	2,000	2,000	(1) 210	(1) 210	1.4E+7
Beryllium	< 1	T	ug/L	4	4	(2) 0.41		290,000
Boron (B)	440	T	ug/L	500	500	1,900		6.2E+7
Cadmium (B)	< 0.2	T	ug/L	5	5	1.3	1.3	190,000
Chromium VI	< 5	T	ug/L	100	100	11		460,000
Cobalt	< 15	T	ug/L	40	100	100		2.4E+6
Copper (B)	110	T	ug/L	1,000	1,000	(1) 5		7.4E+6
Iron (B)	79	T	ug/L	300	300	NA		5.8E+7
Lead (B)	< 1	T	ug/L	4	4	4.8	4.8	ID
Lithium (B)	< 10	T	ug/L	170	350	96		5.4E+6
Manganese (B)	570	T	ug/L	(1) 50	(1) 50	1,000	1,000	9.1E+6
Mercury, Total	< 0.2	T	ug/L	2	2	(2) 0.0013		56
Molybdenum (B)	< 25	T	ug/L	73	210	800	120	970,000
Nickel (B)	3.7	T	ug/L	100	100	29		7.4E+7
Selenium (B)	< 1	T	ug/L	50	50	5		970,000
Silver (B)	0.39	T	ug/L	34	98	(1) 0.2		1.5E+6
Thallium (B)	< 2	T	ug/L	2	2	3.7	2	13,000
Vanadium	< 2	T	ug/L	4.5	62	12		970,000
Zinc (B)	< 10	T	ug/L	2,400	5,000	66		1.1E+8

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS D in units indicate dissolved results				Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III,IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS		ug/L	ug/L	ug/L	ug/L	ug/L
W-78, Collected: 8/8/2008-18:26				ug/L	ug/L	ug/L	ug/L	ug/L
<i>Nitrogen Forms</i>								
Ammonia	3,300	T	ug/L	10,000	10,000			ID
Ammonia, Unionized, Warm Bod	25	T	ug/L			53		
Nitrogen	3,500	T	ug/L	10,000	10,000			
<i>Nonspecific Grouping</i>								
Chloride	8,000	T	ug/L	250,000	250,000	50,000	50,000	ID
Phosphorus, Total	70	T	ug/L	63,000	240,000	1,000		ID
Sulfate	24,000	T	ug/L	250,000	250,000	NA		ID

Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels, Part 213 Tier Risk-Based Screening levels (RBSLs)

: Lake Linden August 2008 All Results

LABORATORY RESULTS <small>D in units indicate dissolved results</small>			Residential and Commercial I Drinking Water Criteria And RBSLs	Industrial and Commercial II, III, IV Drinking Water Criteria and RBSLs	Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources)	Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources)	Groundwater Contact Criteria and RBSLs
PARAMETER	RESULT	UNITS					

(1) criteria was exceeded. (2) reporting limit was above the criteria. NOTE: Dark shaded results indicate at least one criteria was exceeded.

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and footnote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

When more than one method is used to analyze for a parameter then each result will be shown in the reports.

Factors Used to Establish or Calculate Some Criteria

Land Use Residential

Groundwater to Surface Water Interface Factors

It was indicated that the GSI pathway is relevant.

Receiving Water Characteristics

Water Body <u>Inland Lake</u>	Maximum pH <u>7</u> pH	Hardness <u>50</u>
Cold or Warm <u>Warm Body</u>	Maximum T <u>85</u> F	pH <u>7</u> pH

GSI Criterion Required by Section 20120a(15) of the NREPA ¹

Phosphorus GSI Criterion

The water body type was indicated to be: Inland Lake. No phosphorus GSI criterion was provided.

Total Dissolved Solids GSI Criterion

No total dissolved solid data was reported.

Dissolved Oxygen GSI Criterion

No dissolved oxygen data was reported.

Chloride GSI Criterion ²

It was indicated that the groundwaters are discharging into the Great Lakes or connecting waters. A criterion of 50,000 ug/L applies.

Fraction Un-ionized Ammonia ³

The fraction of un-ionized ammonia was calculated to be .0077 based on the maximum temperature and pH of the receiving water.

Polychlorinated biphenyls (PCBS) ⁴

It was indicated that TSCA was applicable and the area was not capped. A criteria of 1,000 applies.

Lead Criteria Based on Soil Concentrations ⁵

Lead criteria based on soil concentrations was not established.

Source Size Modifier ⁶ Size 300 acre Modifier 0.4

Soil Saturation (flagged with the notation (3) when multiple gasoline contaminants are present)

If the soil concentration exceeds Csat and only one contaminant is present at the site, the criteria column reports "> Csat" to indicate that the criteria are not applicable where saturated conditions exist. If multiple contaminants are present, the Csat values are not applicable. In such situations, do not use the Csat values; Csat values were developed to address those situations where only one hazardous substance is present. For those sites with more than one gasoline-related contaminant present, the contaminants and the applicable criteria are flagged.

Filtering Used for Report

This report includes contaminants with Part 201 generic cleanup criteria and Part 213 Tier 1 RBSLs.

(1) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (EE).

(2) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (FF).

(3) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (CC).

(4) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (T).

(5) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (L).

(6) MDEQ, Remediation and Redevelopment Division, Operational Memorandum No. 1, Attachment 1, Footnote (Y).

APPENDIX C
SOIL CORE DESCRIPTIONS

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
H225	3	0-0.2 0.2-0.4 0.4-0.6 0.6-1.75 1.75-2.65 2.65-3	Moist to dry grades, tan and red, fine to medium sand. Saturated, red and tan, fine to medium sand. Saturated, black and red, fine to medium sand with occasional fine 3 mm gravel. Saturated, dark red and brown, fine to medium sand with occasional fine, 3 mm, angular to sub angular gravel. Saturated, fine to coarse, angular sand, more medium to coarse for $\frac{3}{4}$ of lower section. Saturated, fine to medium sand.	XRF at 3 in., 13 in., 26 in., and 34 in.
H209	1.55	0-0.6 0.6-1 1-1.25 1.25-1.55	Saturated to moist, dark red and brown, soft, angular to sub angular, fine to coarse sand. Saturated to moist, dark red and dark brown, soft, angular to sub angular, fine to coarse sand. Saturated to moist, very dark black and brown, fine gravel with some medium sand and trace coarse sand. Saturated to moist, red and brown with some black woody organic debris.	XRF at 3 in. and 14 in.
H50	2.55	0-0.08 0.08-0.38 0.38-0.64 0.64-0.97 0.97-2.55	Moist, dark red and brown, cohesive, fine to medium sand with organic plant material. Moist, dark red and brown, cohesive, fine to medium sand. Moist, red and brown, cohesive, fine to medium sand. Moist, red and brown, cohesive, fine sand with a few dark 3 mm bands in it. Moist, red and brown, cohesive, fine to medium sand with a fining upward sequence, mainly angular to sub angular.	XRF at 2 in., 9 in. and 21 in.

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
H43	3.25	0-0.54 0.54-1.4 1.4-1.67 1.67-1.86 1.86-3.1 3.1-3.25	Moist, red, fine to medium sand with some coarse sand, and trace reddish brown, angular, 2-3 mm, fine gravel. Moist, fine to coarse sand with 3 mm fine gravel and trace, sub angular, 5/8 in. stones/pebbles and yellow wood fibers at the bottom. Moist, dark gray and black, very fine sand and silty sediments mixed with organics. Moist, dark red and brown, fine to coarse sand with trace angular to sub angular, 3 mm gravel. Moist, red and brown, fine to very fine sand with noticeable stratification of thin fine and coarse layers, fine layers are darker. Moist, dark brown, fine to coarse, angular sand with trace sub angular, 2-3 mm gravel.	XRF at 6 in., 14 in., 18 in., 22 in. and 30 in.
Core #1	2.4	0-0.25 0.25-0.45 0.45-0.58 0.58-0.85 0.85-1.23 1.23-2.4	Moist, brown, organic, rich topsoil with grass and roots and fine to medium sand. Moist, reddish rusty brown, sub angular to sub rounded, fine to coarse, quartz sand with some organics. Moist, fine to medium sand with trace coarse sand and abundant organics, roots and stems. Moist, fine to medium sand with trace coarse sand and minor roots. Moist, dark brown, fine sand with some medium sand with dark organic matter. Moist, rusty dark brown, fine to coarse sand with some angular to sub angular 2-5 mm, fine gravel and occasional sub angular to sub rounded, ½ in. stones.	XRF at 2 in., 6 in., 14 in., and 24 in.

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
Core #2	1.89	0-0.35 0.35-1.06 1.06-1.32 1.32-1.89	Dark black and brown, organic, rich topsoil with abundant roots and fine sand. Rusty brown, fine sand with a fining up sequence; bottom is fine to medium sand with some coarse sand grading to fine sand on top. Dark brown, fine to medium sand with some coarse sand and trace, angular. 2-4 mm, fine gravel. Red and brown, angular, fine to medium stampsands at bottom grading to coarser, fine to coarse stampsands with trace, 3 mm fine gravel.	XRF at 2 in., 7 in., 14 in., and 20 in.
Core #3	2.42	0-0.24 0.24-0.78 0.78-1.42 1.42-2.06 2.06-2.42	Dark blackish-brown and rusty brown, very fine to fine sand and silty top soil with grass and roots. Quartz, fine to coarse sand with trace sub angular, 2-3 mm fine gravel with silt mixed in top 2 in. and one ¼ in. tree stem. Dark brown, fine sand with some medium sand and trace coarse sand and 3 mm fine gravel with some organic material, woody fibers, layering in ¼ to ½ in. layers. Red and brown, fine to coarse stampsands with trace, angular, 3 mm fine gravel. Rusty brown, fine sand with some medium sand with 4 to 5 fine, 1/8 to 3/16 in. layers of silty, maroon and red sand.	XRF at 1 in., 6 in., 13 in., 19 in. and 25 in.

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
Core #4	0.4	0-0.4	Moist, brown, organic, rich topsoil.	Crushed core liner, not sure how much soil was recovered. XRF at 2 in. (organic matter)
Core #5	0-?	0-?	Brown to dark brown, organic, rich topsoil with fine sand and silt with grass and roots and one sub rounded 1 in. stone.	Crushed core liner, not sure how much soil was recovered. XRF at 4 in.
Core #7	0.65	0-0.32 0.32-0.65	Blackish-brown, organic, rich topsoil with roots and silty, very fine sand. Rusty brown, fine to medium sand with roots and some angular 1.25 in. stones.	Crushed core liner. XRF at 1 in. and 4 in.
Core #8	1.41	0-1.05 1.05-1.35 1.35-1.41	Moist, red and brown, fine sand with some silt and sub angular to sub rounded small ¼ to ½ in. pebbles. Moist, dark gray and brown silt and very fine sand with some angular, fine 2-3 mm gravel. Moist, light brown, fine to medium quartz sand.	XRF at 4 in and 14 in.
Core # 8A	2.65	0-0.61 0.61-1.35 1.35-1.51 1.51-2.46 2.46-2.65	Rusty brown, fine to very fine sand with occasional sub angular ¼ in. pebbles. Moist, rusty brown, stiff, very fine to fine sand with silt and occasional sub angular ¼ in. pebbles. Moist, dark black and brown, stiff, very fine sand and silt. Brown mixed fine to coarse sand with trace, sub angular, fine 2-3 mm gravel with one ¾ in. organic, rich layer, and 4 in. fine gravel with fine to coarse sand layer. Dark black and brown, organic, rich silty zone.	XRF at 3 in., 6 in., 10 in., 15 in., 20 in., and 28 in.

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
W16	2.83	0-0.25 0.25-0.73 0.73-1.05 1.05-1.80 1.80-2.15 2.15-2.83	Rusty brown, fine sand with medium sand and trace, angular to sub angular, fine 3-4 mm gravel. Moist, dark brown to rusty brown, organic, rich mix of stiff, silty, fine sand, bottom 1.25 in. moist, rusty brown, stiff silt. Olive brown, cohesive, moderately soft silt with organic material. Dark brown, angular to sub angular, fine to coarse sand mixed with sub rounded, fine ½ in. gravel. Light brown, fine to medium sand with some coarse sand and organic material. Dark black and brown, very fine sand and silt with organic woody fibers especially at bottom.	XRF at 2 in., 6 in., 11 in., 16 in., 20 in., 23 in., 27 in., and 30 in.
H2	3.5	0-0.12 0.12-0.62 0.62-1.57 1.57-2.48 2.48-3.5	Moist, rusty brown, fine to medium stampsands with silt layers. Moist, rusty brown, fine to medium stampsands mix. Moist, dark brown with some rusty hues, interlayered silt and very fine to fine stampsands. Moist, dark rusty brown, fine stamp sands interlayered with silt and very fine stampsands. Moist, rusty brown, fine stampsands with some medium stampsands and a few thin silty and very fine stampsands layers.	Fine layers more brown than red. XRF at 4 in., 12 in., 18 in., 22 in., and 32 in.

SAMPLE NUMBER	RECOVERY (ft.)	UNIT THICKNESS (ft.)	LITHOLOGICAL DESCRIPTION	SAMPLE INTERVALS AND COMMENTS
Core #10	2	0-0.44	Saturated, dark purple and brown, stiff silt (dries out when pressed on).	XRF at 2 in., 8 in., and 18 in.
		0.44-1.77	Saturated, purple and brown silt with uniform, thixotropic, very fine sand.	
		1.77-2	Saturated, purple and brown, silty, stiff, very fine sand.	
Core #11	3.14	0-3.14	Moist, uniform, rusty brown, very fine sand with some silt and 4 thin ¼ in. silt layers at the bottom.	XRF at 10 in. and 28 in.

METHOD 6200

FIELD PORTABLE X-RAY FLUORESCENCE SPECTROMETRY FOR THE DETERMINATION OF ELEMENTAL CONCENTRATIONS IN SOIL AND SEDIMENT

SW-846 is not intended to be an analytical training manual. Therefore, method procedures are written based on the assumption that they will be performed by analysts who are formally trained in at least the basic principles of chemical analysis and in the use of the subject technology.

In addition, SW-846 methods, with the exception of required method use for the analysis of method-defined parameters, are intended to be guidance methods which contain general information on how to perform an analytical procedure or technique which a laboratory can use as a basic starting point for generating its own detailed Standard Operating Procedure (SOP), either for its own general use or for a specific project application. The performance data included in this method are for guidance purposes only, and are not intended to be and must not be used as absolute QC acceptance criteria for purposes of laboratory accreditation.

1.0 SCOPE AND APPLICATION

1.1 This method is applicable to the in situ and intrusive analysis of the 26 analytes listed below for soil and sediment samples. Some common elements are not listed in this method because they are considered "light" elements that cannot be detected by field portable x-ray fluorescence (FPXRF). These light elements are: lithium, beryllium, sodium, magnesium, aluminum, silicon, and phosphorus. Most of the analytes listed below are of environmental concern, while a few others have interference effects or change the elemental composition of the matrix, affecting quantitation of the analytes of interest. Generally elements of atomic number 16 or greater can be detected and quantitated by FPXRF. The following RCRA analytes have been determined by this method:

Analytes	CAS Registry No.
Antimony (Sb)	7440-36-0
Arsenic (As)	7440-38-0
Barium (Ba)	7440-39-3
Cadmium (Cd)	7440-43-9
Chromium (Cr)	7440-47-3
Cobalt (Co)	7440-48-4
Copper (Cu)	7440-50-8
Lead (Pb)	7439-92-1
Mercury (Hg)	7439-97-6
Nickel (Ni)	7440-02-0
Selenium (Se)	7782-49-2
Silver (Ag)	7440-22-4
Thallium (Tl)	7440-28-0
Tin (Sn)	7440-31-5

Analytes	CAS Registry No.
Vanadium (V)	7440-62-2
Zinc (Zn)	7440-66-6

In addition, the following non-RCRA analytes have been determined by this method:

Analytes	CAS Registry No.
Calcium (Ca)	7440-70-2
Iron (Fe)	7439-89-6
Manganese (Mn)	7439-96-5
Molybdenum (Mo)	7439-93-7
Potassium (K)	7440-09-7
Rubidium (Rb)	7440-17-7
Strontium (Sr)	7440-24-6
Thorium (Th)	7440-29-1
Titanium (Ti)	7440-32-6
Zirconium (Zr)	7440-67-7

1.2 This method is a screening method to be used with confirmatory analysis using other techniques (e.g., flame atomic absorption spectrometry (FLAA), graphite furnace atomic absorption spectrometry (GFAA), inductively coupled plasma-atomic emission spectrometry, (ICP-AES), or inductively coupled plasma-mass spectrometry, (ICP-MS)). This method's main strength is that it is a rapid field screening procedure. The method's lower limits of detection are typically above the toxicity characteristic regulatory level for most RCRA analytes. However, when the obtainable values for precision, accuracy, and laboratory-established sensitivity of this method meet project-specific data quality objectives (DQOs), FPXRF is a fast, powerful, cost effective technology for site characterization.

1.3 The method sensitivity or lower limit of detection depends on several factors, including the analyte of interest, the type of detector used, the type of excitation source, the strength of the excitation source, count times used to irradiate the sample, physical matrix effects, chemical matrix effects, and interelement spectral interferences. Example lower limits of detection for analytes of interest in environmental applications are shown in Table 1. These limits apply to a clean spiked matrix of quartz sand (silicon dioxide) free of interelement spectral interferences using long (100 -600 second) count times. These sensitivity values are given for guidance only and may not always be achievable, since they will vary depending on the sample matrix, which instrument is used, and operating conditions. A discussion of performance-based sensitivity is presented in Sec. 9.6.

1.4 Analysts should consult the disclaimer statement at the front of the manual and the information in Chapter Two for guidance on the intended flexibility in the choice of methods, apparatus, materials, reagents, and supplies, and on the responsibilities of the analyst for demonstrating that the techniques employed are appropriate for the analytes of interest, in the matrix of interest, and at the levels of concern.

In addition, analysts and data users are advised that, except where explicitly specified in a regulation, the use of SW-846 methods is *not* mandatory in response to Federal testing requirements. The information contained in this method is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to generate results that meet the data quality objectives for the intended application.

1.5 Use of this method is restricted to use by, or under supervision of, personnel appropriately experienced and trained in the use and operation of an XRF instrument. Each analyst must demonstrate the ability to generate acceptable results with this method.

2.0 SUMMARY OF METHOD

2.1 The FPXRF technologies described in this method use either sealed radioisotope sources or x-ray tubes to irradiate samples with x-rays. When a sample is irradiated with x-rays, the source x-rays may undergo either scattering or absorption by sample atoms. This latter process is known as the photoelectric effect. When an atom absorbs the source x-rays, the incident radiation dislodges electrons from the innermost shells of the atom, creating vacancies. The electron vacancies are filled by electrons cascading in from outer electron shells. Electrons in outer shells have higher energy states than inner shell electrons, and the outer shell electrons give off energy as they cascade down into the inner shell vacancies. This rearrangement of electrons results in emission of x-rays characteristic of the given atom. The emission of x-rays, in this manner, is termed x-ray fluorescence.

Three electron shells are generally involved in emission of x-rays during FPXRF analysis of environmental samples. The three electron shells include the K, L, and M shells. A typical emission pattern, also called an emission spectrum, for a given metal has multiple intensity peaks generated from the emission of K, L, or M shell electrons. The most commonly measured x-ray emissions are from the K and L shells; only metals with an atomic number greater than 57 have measurable M shell emissions.

Each characteristic x-ray line is defined with the letter K, L, or M, which signifies which shell had the original vacancy and by a subscript alpha (α), beta (β), or gamma (γ) etc., which indicates the higher shell from which electrons fell to fill the vacancy and produce the x-ray. For example, a K_{α} line is produced by a vacancy in the K shell filled by an L shell electron, whereas a K_{β} line is produced by a vacancy in the K shell filled by an M shell electron. The K_{α} transition is on average 6 to 7 times more probable than the K_{β} transition; therefore, the K_{α} line is approximately 7 times more intense than the K_{β} line for a given element, making the K_{α} line the choice for quantitation purposes.

The K lines for a given element are the most energetic lines and are the preferred lines for analysis. For a given atom, the x-rays emitted from L transitions are always less energetic than those emitted from K transitions. Unlike the K lines, the main L emission lines (L_{α} and L_{β}) for an element are of nearly equal intensity. The choice of one or the other depends on what interfering element lines might be present. The L emission lines are useful for analyses involving elements of atomic number (Z) 58 (cerium) through 92 (uranium).

An x-ray source can excite characteristic x-rays from an element only if the source energy is greater than the absorption edge energy for the particular line group of the element, that is, the K absorption edge, L absorption edge, or M absorption edge energy. The absorption edge energy is somewhat greater than the corresponding line energy. Actually, the K absorption edge energy is approximately the sum of the K, L, and M line energies of the particular element, and the L absorption edge energy is approximately the sum of the L and M line energies. FPXRF is more sensitive to an element with an absorption edge energy close to but less than

the excitation energy of the source. For example, when using a cadmium-109 source, which has an excitation energy of 22.1 kiloelectron volts (keV), FPXRF would exhibit better sensitivity for zirconium which has a K line energy of 15.77 keV than to chromium, which has a K line energy of 5.41 keV.

2.2 Under this method, inorganic analytes of interest are identified and quantitated using a field portable energy-dispersive x-ray fluorescence spectrometer. Radiation from one or more radioisotope sources or an electrically excited x-ray tube is used to generate characteristic x-ray emissions from elements in a sample. Up to three sources may be used to irradiate a sample. Each source emits a specific set of primary x-rays that excite a corresponding range of elements in a sample. When more than one source can excite the element of interest, the source is selected according to its excitation efficiency for the element of interest.

For measurement, the sample is positioned in front of the probe window. This can be done in two manners using FPXRF instruments, specifically, in situ or intrusive. If operated in the in situ mode, the probe window is placed in direct contact with the soil surface to be analyzed. When an FPXRF instrument is operated in the intrusive mode, a soil or sediment sample must be collected, prepared, and placed in a sample cup. The sample cup is then placed on top of the window inside a protective cover for analysis.

Sample analysis is then initiated by exposing the sample to primary radiation from the source. Fluorescent and backscattered x-rays from the sample enter through the detector window and are converted into electric pulses in the detector. The detector in FPXRF instruments is usually either a solid-state detector or a gas-filled proportional counter. Within the detector, energies of the characteristic x-rays are converted into a train of electric pulses, the amplitudes of which are linearly proportional to the energy of the x-rays. An electronic multichannel analyzer (MCA) measures the pulse amplitudes, which is the basis of qualitative x-ray analysis. The number of counts at a given energy per unit of time is representative of the element concentration in a sample and is the basis for quantitative analysis. Most FPXRF instruments are menu-driven from software built into the units or from personal computers (PC).

The measurement time of each source is user-selectable. Shorter source measurement times (30 seconds) are generally used for initial screening and hot spot delineation, and longer measurement times (up to 300 seconds) are typically used to meet higher precision and accuracy requirements.

FPXRF instruments can be calibrated using the following methods: internally using fundamental parameters determined by the manufacturer, empirically based on site-specific calibration standards (SSCS), or based on Compton peak ratios. The Compton peak is produced by backscattering of the source radiation. Some FPXRF instruments can be calibrated using multiple methods.

3.0 DEFINITIONS

- 3.1 FPXRF – Field portable x-ray fluorescence.
- 3.2 MCA -- Multichannel analyzer for measuring pulse amplitude.
- 3.3 SSCS – Site-specific calibration standards.
- 3.4 FP – Fundamental parameter.
- 3.5 ROI – Region of interest.

3.6 SRM -- Standard reference material; a standard containing certified amounts of metals in soil or sediment.

3.7 eV -- Electron volt; a unit of energy equivalent to the amount of energy gained by an electron passing through a potential difference of one volt.

3.8 Refer to Chapter One, Chapter Three, and the manufacturer's instructions for other definitions that may be relevant to this procedure.

4.0 INTERFERENCES

4.1 The total method error for FPXRF analysis is defined as the square root of the sum of squares of both instrument precision and user- or application-related error. Generally, instrument precision is the least significant source of error in FPXRF analysis. User- or application-related error is generally more significant and varies with each site and method used. Some sources of interference can be minimized or controlled by the instrument operator, but others cannot. Common sources of user- or application-related error are discussed below.

4.2 Physical matrix effects result from variations in the physical character of the sample. These variations may include such parameters as particle size, uniformity, homogeneity, and surface condition. For example, if any analyte exists in the form of very fine particles in a coarser-grained matrix, the analyte's concentration measured by the FPXRF will vary depending on how fine particles are distributed within the coarser-grained matrix. If the fine particles "settle" to the bottom of the sample cup (i.e., against the cup window), the analyte concentration measurement will be higher than if the fine particles are not mixed in well and stay on top of the coarser-grained particles in the sample cup. One way to reduce such error is to grind and sieve all soil samples to a uniform particle size thus reducing sample-to-sample particle size variability. Homogeneity is always a concern when dealing with soil samples. Every effort should be made to thoroughly mix and homogenize soil samples before analysis. Field studies have shown heterogeneity of the sample generally has the largest impact on comparability with confirmatory samples.

4.3 Moisture content may affect the accuracy of analysis of soil and sediment sample analyses. When the moisture content is between 5 and 20 percent, the overall error from moisture may be minimal. However, moisture content may be a major source of error when analyzing samples of surface soil or sediment that are saturated with water. This error can be minimized by drying the samples in a convection or toaster oven. Microwave drying is not recommended because field studies have shown that microwave drying can increase variability between FPXRF data and confirmatory analysis and because metal fragments in the sample can cause arcing to occur in a microwave.

4.4 Inconsistent positioning of samples in front of the probe window is a potential source of error because the x-ray signal decreases as the distance from the radioactive source increases. This error is minimized by maintaining the same distance between the window and each sample. For the best results, the window of the probe should be in direct contact with the sample, which means that the sample should be flat and smooth to provide a good contact surface.

4.5 Chemical matrix effects result from differences in the concentrations of interfering elements. These effects occur as either spectral interferences (peak overlaps) or as x-ray absorption and enhancement phenomena. Both effects are common in soils contaminated with heavy metals. As examples of absorption and enhancement effects; iron (Fe) tends to absorb copper (Cu) x-rays, reducing the intensity of the Cu measured by the detector, while chromium (Cr) will be enhanced at the expense of Fe because the absorption edge of Cr is slightly lower in energy than the fluorescent peak of iron. The effects can be corrected mathematically through the use of fundamental parameter (FP) coefficients. The effects also can be compensated for using SSCS, which contain all the elements present on site that can interfere with one another.

4.6 When present in a sample, certain x-ray lines from different elements can be very close in energy and, therefore, can cause interference by producing a severely overlapped spectrum. The degree to which a detector can resolve the two different peaks depends on the energy resolution of the detector. If the energy difference between the two peaks in electron volts is less than the resolution of the detector in electron volts, then the detector will not be able to fully resolve the peaks.

The most common spectrum overlaps involve the K_{β} line of element Z-1 with the K_{α} line of element Z. This is called the K_{α}/K_{β} interference. Because the $K_{\alpha}:K_{\beta}$ intensity ratio for a given element usually is about 7:1, the interfering element, Z-1, must be present at large concentrations to cause a problem. Two examples of this type of spectral interference involve the presence of large concentrations of vanadium (V) when attempting to measure Cr or the presence of large concentrations of Fe when attempting to measure cobalt (Co). The V K_{α} and K_{β} energies are 4.95 and 5.43 keV, respectively, and the Cr K_{α} energy is 5.41 keV. The Fe K_{α} and K_{β} energies are 6.40 and 7.06 keV, respectively, and the Co K_{α} energy is 6.92 keV. The difference between the V K_{β} and Cr K_{α} energies is 20 eV, and the difference between the Fe K_{β} and the Co K_{α} energies is 140 eV. The resolution of the highest-resolution detectors in FPXRF instruments is 170 eV. Therefore, large amounts of V and Fe will interfere with quantitation of Cr or Co, respectively. The presence of Fe is a frequent problem because it is often found in soils at tens of thousands of parts per million (ppm).

4.7 Other interferences can arise from K/L, K/M, and L/M line overlaps, although these overlaps are less common. Examples of such overlap involve arsenic (As) K_{α} /lead (Pb) L_{α} and sulfur (S) K_{α} /Pb M_{α} . In the As/Pb case, Pb can be measured from the Pb L_{β} line, and As can be measured from either the As K_{α} or the As K_{β} line; in this way the interference can be corrected. If the As K_{β} line is used, sensitivity will be decreased by a factor of two to five times because it is a less intense line than the As K_{α} line. If the As K_{α} line is used in the presence of Pb, mathematical corrections within the instrument software can be used to subtract out the Pb interference. However, because of the limits of mathematical corrections, As concentrations cannot be efficiently calculated for samples with Pb:As ratios of 10:1 or more. This high ratio of Pb to As may result in reporting of a "nondetect" or a "less than" value (e.g., <300 ppm) for As, regardless of the actual concentration present.

No instrument can fully compensate for this interference. It is important for an operator to understand this limitation of FPXRF instruments and consult with the manufacturer of the FPXRF instrument to evaluate options to minimize this limitation. The operator's decision will be based on action levels for metals in soil established for the site, matrix effects, capabilities of the instrument, data quality objectives, and the ratio of lead to arsenic known to be present at the site. If a site is encountered that contains lead at concentrations greater than ten times the concentration of arsenic it is advisable that all critical soil samples be sent off site for confirmatory analysis using other techniques (e.g., flame atomic absorption spectrometry (FLAA), graphite furnace atomic absorption spectrometry (GFAA), inductively coupled plasma-

atomic emission spectrometry, (ICP-AES), or inductively coupled plasma-mass spectrometry, (ICP-MS)).

4.8 If SSCS are used to calibrate an FPXRF instrument, the samples collected must be representative of the site under investigation. Representative soil sampling ensures that a sample or group of samples accurately reflects the concentrations of the contaminants of concern at a given time and location. Analytical results for representative samples reflect variations in the presence and concentration ranges of contaminants throughout a site. Variables affecting sample representativeness include differences in soil type, contaminant concentration variability, sample collection and preparation variability, and analytical variability, all of which should be minimized as much as possible.

4.9 Soil physical and chemical effects may be corrected using SSCS that have been analyzed by inductively coupled plasma (ICP) or atomic absorption (AA) methods. However, a major source of error can be introduced if these samples are not representative of the site or if the analytical error is large. Another concern is the type of digestion procedure used to prepare the soil samples for the reference analysis. Analytical results for the confirmatory method will vary depending on whether a partial digestion procedure, such as Method 3050, or a total digestion procedure, such as Method 3052, is used. It is known that depending on the nature of the soil or sediment, Method 3050 will achieve differing extraction efficiencies for different analytes of interest. The confirmatory method should meet the project-specific data quality objectives (DQOs).

XRF measures the total concentration of an element; therefore, to achieve the greatest comparability of this method with the reference method (reduced bias), a total digestion procedure should be used for sample preparation. However, in the study used to generate the performance data for this method (see Table 8), the confirmatory method used was Method 3050, and the FPXRF data compared very well with regression correlation coefficients (r often exceeding 0.95, except for barium and chromium). The critical factor is that the digestion procedure and analytical reference method used should meet the DQOs of the project and match the method used for confirmation analysis.

4.10 Ambient temperature changes can affect the gain of the amplifiers producing instrument drift. Gain or drift is primarily a function of the electronics (amplifier or preamplifier) and not the detector as most instrument detectors are cooled to a constant temperature. Most FPXRF instruments have a built-in automatic gain control. If the automatic gain control is allowed to make periodic adjustments, the instrument will compensate for the influence of temperature changes on its energy scale. If the FPXRF instrument has an automatic gain control function, the operator will not have to adjust the instrument's gain unless an error message appears. If an error message appears, the operator should follow the manufacturer's procedures for troubleshooting the problem. Often, this involves performing a new energy calibration. The performance of an energy calibration check to assess drift is a quality control measure discussed in Sec. 9.2.

If the operator is instructed by the manufacturer to manually conduct a gain check because of increasing or decreasing ambient temperature, it is standard to perform a gain check after every 10 to 20 sample measurements or once an hour whichever is more frequent. It is also suggested that a gain check be performed if the temperature fluctuates more than 10° F. The operator should follow the manufacturer's recommendations for gain check frequency.

5.0 SAFETY

5.1 This method does not address all safety issues associated with its use. The user is responsible for maintaining a safe work environment and a current awareness file of OSHA regulations regarding the safe handling of the chemicals listed in this method. A reference file of material safety data sheets (MSDSs) should be available to all personnel involved in these analyses.

NOTE: No MSDS applies directly to the radiation-producing instrument because that is covered under the Nuclear Regulatory Commission (NRC) or applicable state regulations.

5.2 Proper training for the safe operation of the instrument and radiation training should be completed by the analyst prior to analysis. Radiation safety for each specific instrument can be found in the operator's manual. Protective shielding should never be removed by the analyst or any personnel other than the manufacturer. The analyst should be aware of the local state and national regulations that pertain to the use of radiation-producing equipment and radioactive materials with which compliance is required. There should be a person appointed within the organization that is solely responsible for properly instructing all personnel, maintaining inspection records, and monitoring x-ray equipment at regular intervals.

Licenses for radioactive materials are of two types, specifically: (1) a general license which is usually initiated by the manufacturer for receiving, acquiring, owning, possessing, using, and transferring radioactive material incorporated in a device or equipment, and (2) a specific license which is issued to named persons for the operation of radioactive instruments as required by local, state, or federal agencies. A copy of the radioactive material license (for specific licenses only) and leak tests should be present with the instrument at all times and available to local and national authorities upon request.

X-ray tubes do not require radioactive material licenses or leak tests, but do require approvals and licenses which vary from state to state. In addition, fail-safe x-ray warning lights should be illuminated whenever an x-ray tube is energized. Provisions listed above concerning radiation safety regulations, shielding, training, and responsible personnel apply to x-ray tubes just as to radioactive sources. In addition, a log of the times and operating conditions should be kept whenever an x-ray tube is energized. An additional hazard present with x-ray tubes is the danger of electric shock from the high voltage supply, however, if the tube is properly positioned within the instrument, this is only a negligible risk. Any instrument (x-ray tube or radioisotope based) is capable of delivering an electric shock from the basic circuitry when the system is inappropriately opened.

5.3 Radiation monitoring equipment should be used with the handling and operation of the instrument. The operator and the surrounding environment should be monitored continually for analyst exposure to radiation. Thermal luminescent detectors (TLD) in the form of badges and rings are used to monitor operator radiation exposure. The TLDs or badges should be worn in the area of maximum exposure. The maximum permissible whole-body dose from occupational exposure is 5 Roentgen Equivalent Man (REM) per year. Possible exposure pathways for radiation to enter the body are ingestion, inhaling, and absorption. The best precaution to prevent radiation exposure is distance and shielding.

6.0 EQUIPMENT AND SUPPLIES

The mention of trade names or commercial products in this manual is for illustrative purposes only, and does not constitute an EPA endorsement or exclusive recommendation for

use. The products and instrument settings cited in SW-846 methods represent those products and settings used during method development or subsequently evaluated by the Agency. Glassware, reagents, supplies, equipment, and settings other than those listed in this manual may be employed provided that method performance appropriate for the intended application has been demonstrated and documented.

6.1 FPXRF spectrometer -- An FPXRF spectrometer consists of four major components: (1) a source that provides x-rays; (2) a sample presentation device; (3) a detector that converts x-ray-generated photons emitted from the sample into measurable electronic signals; and (4) a data processing unit that contains an emission or fluorescence energy analyzer, such as an MCA, that processes the signals into an x-ray energy spectrum from which elemental concentrations in the sample may be calculated, and a data display and storage system. These components and additional, optional items, are discussed below.

6.1.1 Excitation sources -- FPXRF instruments use either a sealed radioisotope source or an x-ray tube to provide the excitation source. Many FPXRF instruments use sealed radioisotope sources to produce x-rays in order to irradiate samples. The FPXRF instrument may contain between one and three radioisotope sources. Common radioisotope sources used for analysis for metals in soils are iron Fe-55 (^{55}Fe), cadmium Cd-109 (^{109}Cd), americium Am-241 (^{241}Am), and curium Cm-244 (^{244}Cm). These sources may be contained in a probe along with a window and the detector; the probe may be connected to a data reduction and handling system by means of a flexible cable. Alternatively, the sources, window, and detector may be included in the same unit as the data reduction and handling system.

The relative strength of the radioisotope sources is measured in units of millicuries (mCi). All other components of the FPXRF system being equal, the stronger the source, the greater the sensitivity and precision of a given instrument. Radioisotope sources undergo constant decay. In fact, it is this decay process that emits the primary x-rays used to excite samples for FPXRF analysis. The decay of radioisotopes is measured in "half-lives." The half-life of a radioisotope is defined as the length of time required to reduce the radioisotopes strength or activity by half. Developers of FPXRF technologies recommend source replacement at regular intervals based on the source's half-life. This is due to the ever increasing time required for the analysis rather than a decrease in instrument performance. The characteristic x-rays emitted from each of the different sources have energies capable of exciting a certain range of analytes in a sample. Table 2 summarizes the characteristics of four common radioisotope sources.

X-ray tubes have higher radiation output, no intrinsic lifetime limit, produce constant output over their lifetime, and do not have the disposal problems of radioactive sources but are just now appearing in FPXRF instruments. An electrically-excited x-ray tube operates by bombarding an anode with electrons accelerated by a high voltage. The electrons gain an energy in electron volts equal to the accelerating voltage and can excite atomic transitions in the anode, which then produces characteristic x-rays. These characteristic x-rays are emitted through a window which contains the vacuum necessary for the electron acceleration. An important difference between x-ray tubes and radioactive sources is that the electrons which bombard the anode also produce a continuum of x-rays across a broad range of energies in addition to the characteristic x-rays. This continuum is weak compared to the characteristic x-rays but can provide substantial excitation since it covers a broad energy range. It has the undesired property of producing background in the spectrum near the analyte x-ray lines when it is scattered by the sample. For this reason a filter is often used between the x-ray tube and the sample to suppress the continuum radiation while passing the characteristic x-rays from the anode. This filter is sometimes incorporated into the window of the x-ray tube. The choice of

accelerating voltage is governed both by the anode material, since the electrons must have sufficient energy to excite the anode, which requires a voltage greater than the absorption edge of the anode material and by the instrument's ability to cool the x-ray tube. The anode is most efficiently excited by voltages 2 to 2.5 times the edge energy (most x-rays per unit power to the tube), although voltages as low as 1.5 times the absorption edge energy will work. The characteristic x-rays emitted by the anode are capable of exciting a range of elements in the sample just as with a radioactive source. Table 3 gives the recommended operating voltages and the sample elements excited for some common anodes.

6.1.2 Sample presentation device – FPXRF instruments can be operated in two modes: in situ and intrusive. If operated in the in situ mode, the probe window is placed in direct contact with the soil surface to be analyzed. When an FPXRF instrument is operated in the intrusive mode, a soil or sediment sample must be collected, prepared, and placed in a sample cup. For FPXRF instruments operated in the intrusive mode, the probe may be rotated so that the window faces either upward or downward. A protective sample cover is placed over the window, and the sample cup is placed on top of the window inside the protective sample cover for analysis.

6.1.3 Detectors – The detectors in the FPXRF instruments can be either solid-state detectors or gas-filled, proportional counter detectors. Common solid-state detectors include mercuric iodide (HgI_2), silicon pin diode and lithium-drifted silicon $\text{Si}(\text{Li})$. The HgI_2 detector is operated at a moderately subambient temperature controlled by a low power thermoelectric cooler. The silicon pin diode detector also is cooled via the thermoelectric Peltier effect. The $\text{Si}(\text{Li})$ detector must be cooled to at least $-90\text{ }^\circ\text{C}$ either with liquid nitrogen or by thermoelectric cooling via the Peltier effect. Instruments with a $\text{Si}(\text{Li})$ detector have an internal liquid nitrogen dewar with a capacity of 0.5 to 1.0 L. Proportional counter detectors are rugged and lightweight, which are important features of a field portable detector. However, the resolution of a proportional counter detector is not as good as that of a solid-state detector. The energy resolution of a detector for characteristic x-rays is usually expressed in terms of full width at half-maximum (FWHM) height of the manganese K_α peak at 5.89 keV. The typical resolutions of the above mentioned detectors are as follows: HgI_2 -270 eV; silicon pin diode-250 eV; $\text{Si}(\text{Li})$ -170 eV; and gas-filled, proportional counter-750 eV.

During operation of a solid-state detector, an x-ray photon strikes a biased, solid-state crystal and loses energy in the crystal by producing electron-hole pairs. The electric charge produced is collected and provides a current pulse that is directly proportional to the energy of the x-ray photon absorbed by the crystal of the detector. A gas-filled, proportional counter detector is an ionization chamber filled with a mixture of noble and other gases. An x-ray photon entering the chamber ionizes the gas atoms. The electric charge produced is collected and provides an electric signal that is directly proportional to the energy of the x-ray photon absorbed by the gas in the detector.

6.1.4 Data processing units – The key component in the data processing unit of an FPXRF instrument is the MCA. The MCA receives pulses from the detector and sorts them by their amplitudes (energy level). The MCA counts pulses per second to determine the height of the peak in a spectrum, which is indicative of the target analyte's concentration. The spectrum of element peaks are built on the MCA. The MCAs in FPXRF instruments have from 256 to 2,048 channels. The concentrations of target analytes are usually shown in ppm on a liquid crystal display (LCD) in the instrument. FPXRF instruments can store both spectra and from 3,000 to 5,000 sets of numerical analytical results. Most FPXRF instruments are menu-driven from software built into the

units or from PCs. Once the data-storage memory of an FPXRF unit is full or at any other time, data can be downloaded by means of an RS-232 port and cable to a PC.

6.2 Spare battery and battery charger.

6.3 Polyethylene sample cups -- 31 to 40 mm in diameter with collar, or equivalent (appropriate for FPXRF instrument).

6.4 X-ray window film -- Mylar™, Kapton™, Spectrolene™, polypropylene, or equivalent; 2.5 to 6.0 μm thick.

6.5 Mortar and pestle -- Glass, agate, or aluminum oxide; for grinding soil and sediment samples.

6.6 Containers -- Glass or plastic to store samples.

6.7 Sieves -- 60-mesh (0.25 mm), stainless-steel, Nylon, or equivalent for preparing soil and sediment samples.

6.8 Trowels -- For smoothing soil surfaces and collecting soil samples.

6.9 Plastic bags -- Used for collection and homogenization of soil samples.

6.10 Drying oven -- Standard convection or toaster oven, for soil and sediment samples that require drying.

7.0 REAGENTS AND STANDARDS

7.1 Reagent grade chemicals must be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

7.2 Pure element standards -- Each pure, single-element standard is intended to produce strong characteristic x-ray peaks of the element of interest only. Other elements present must not contribute to the fluorescence spectrum. A set of pure element standards for commonly sought analytes is supplied by the instrument manufacturer, if designated for the instrument; not all instruments require the pure element standards. The standards are used to set the region of interest (ROI) for each element. They also can be used as energy calibration and resolution check samples.

7.3 Site-specific calibration standards -- Instruments that employ fundamental parameters (FP) or similar mathematical models in minimizing matrix effects may not require SSCS. If the FP calibration model is to be optimized or if empirical calibration is necessary, then SSCSs must be collected, prepared, and analyzed.

7.3.1 The SSCS must be representative of the matrix to be analyzed by FPXRF. These samples must be well homogenized. A minimum of 10 samples spanning the concentration ranges of the analytes of interest and of the interfering elements must be obtained from the site. A sample size of 4 to 8 ounces is recommended, and standard glass sampling jars should be used.

7.3.2 Each sample should be oven-dried for 2 to 4 hr at a temperature of less than 150 °C. If mercury is to be analyzed, a separate sample portion should be dried at ambient temperature as heating may volatilize the mercury. When the sample is dry, all large, organic debris and nonrepresentative material, such as twigs, leaves, roots, insects, asphalt, and rock should be removed. The sample should be homogenized (see Sec. 7.3.3) and then a representative portion ground with a mortar and pestle or other mechanical means, prior to passing through a 60-mesh sieve. Only the coarse rock fraction should remain on the screen.

7.3.3 The sample should be homogenized by using a riffle splitter or by placing 150 to 200 g of the dried, sieved sample on a piece of kraft or butcher paper about 1.5 by 1.5 feet in size. Each corner of the paper should be lifted alternately, rolling the soil over on itself and toward the opposite corner. The soil should be rolled on itself 20 times. Approximately 5 g of the sample should then be removed and placed in a sample cup for FPXRF analysis. The rest of the prepared sample should be sent off site for ICP or AA analysis. The method use for confirmatory analysis should meet the data quality objectives of the project.

7.4 Blank samples -- The blank samples should be from a "clean" quartz or silicon dioxide matrix that is free of any analytes at concentrations above the established lower limit of detection. These samples are used to monitor for cross-contamination and laboratory-induced contaminants or interferences.

7.5 Standard reference materials -- Standard reference materials (SRMs) are standards containing certified amounts of metals in soil or sediment. These standards are used for accuracy and performance checks of FPXRF analyses. SRMs can be obtained from the National Institute of Standards and Technology (NIST), the U.S. Geological Survey (USGS), the Canadian National Research Council, and the national bureau of standards in foreign nations. Pertinent NIST SRMs for FPXRF analysis include 2704, Buffalo River Sediment; 2709, San Joaquin Soil; and 2710 and 2711, Montana Soil. These SRMs contain soil or sediment from actual sites that has been analyzed using independent inorganic analytical methods by many different laboratories. When these SRMs are unavailable, alternate standards may be used (e.g., NIST 2702).

8.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

Sample handling and preservation procedures used in FPXRF analyses should follow the guidelines in Chapter Three, "Inorganic Analytes."

9.0 QUALITY CONTROL

9.1 Follow the manufacturer's instructions for the quality control procedures specific to use of the testing product. Refer to Chapter One for additional guidance on quality assurance (QA) and quality control (QC) protocols. Any effort involving the collection of analytical data should include development of a structured and systematic planning document, such as a Quality Assurance Project Plan (QAPP) or a Sampling and Analysis Plan (SAP), which translates project objectives and specifications into directions for those that will implement the project and assess the results.

9.2 Energy calibration check -- To determine whether an FPXRF instrument is operating within resolution and stability tolerances, an energy calibration check should be run. The energy calibration check determines whether the characteristic x-ray lines are shifting,

which would indicate drift within the instrument. As discussed in Sec. 4.10, this check also serves as a gain check in the event that ambient temperatures are fluctuating greatly (more than 10 °F).

9.2.1 The energy calibration check should be run at a frequency consistent with manufacturer's recommendations. Generally, this would be at the beginning of each working day, after the batteries are changed or the instrument is shut off, at the end of each working day, and at any other time when the instrument operator believes that drift is occurring during analysis. A pure element such as iron, manganese, copper, or lead is often used for the energy calibration check. A manufacturer-recommended count time per source should be used for the check.

9.2.2 The instrument manufacturer's manual specifies the channel or kiloelectron volt level at which a pure element peak should appear and the expected intensity of the peak. The intensity and channel number of the pure element as measured using the source should be checked and compared to the manufacturer's recommendation. If the energy calibration check does not meet the manufacturer's criteria, then the pure element sample should be repositioned and reanalyzed. If the criteria are still not met, then an energy calibration should be performed as described in the manufacturer's manual. With some FPXRF instruments, once a spectrum is acquired from the energy calibration check, the peak can be optimized and realigned to the manufacturer's specifications using their software.

9.3 Blank samples -- Two types of blank samples should be analyzed for FPXRF analysis, specifically, instrument blanks and method blanks.

9.3.1 An instrument blank is used to verify that no contamination exists in the spectrometer or on the probe window. The instrument blank can be silicon dioxide, a polytetrafluoroethylene (PTFE) block, a quartz block, "clean" sand, or lithium carbonate. This instrument blank should be analyzed on each working day before and after analyses are conducted and once per every twenty samples. An instrument blank should also be analyzed whenever contamination is suspected by the analyst. The frequency of analysis will vary with the data quality objectives of the project. A manufacturer-recommended count time per source should be used for the blank analysis. No element concentrations above the established lower limit of detection should be found in the instrument blank. If concentrations exceed these limits, then the probe window and the check sample should be checked for contamination. If contamination is not a problem, then the instrument must be "zeroed" by following the manufacturer's instructions.

9.3.2 A method blank is used to monitor for laboratory-induced contaminants or interferences. The method blank can be "clean" silica sand or lithium carbonate that undergoes the same preparation procedure as the samples. A method blank must be analyzed at least daily. The frequency of analysis will depend on the data quality objectives of the project. If the method blank does not contain the target analyte at a level that interferes with the project-specific data quality objectives then the method blank would be considered acceptable. In the absence of project-specific data quality objectives, if the blank is less than the lowest level of detection or less than 10% of the lowest sample concentration for the analyte, whichever is greater, then the method blank would be considered acceptable. If the method blank cannot be considered acceptable, the cause of the problem must be identified, and all samples analyzed with the method blank must be reanalyzed.

9.4 Calibration verification checks -- A calibration verification check sample is used to check the accuracy of the instrument and to assess the stability and consistency of the analysis for the analytes of interest. A check sample should be analyzed at the beginning of each working day, during active sample analyses, and at the end of each working day. The frequency of calibration checks during active analysis will depend on the data quality objectives of the project. The check sample should be a well characterized soil sample from the site that is representative of site samples in terms of particle size and degree of homogeneity and that contains contaminants at concentrations near the action levels. If a site-specific sample is not available, then an NIST or other SRM that contains the analytes of interest can be used to verify the accuracy of the instrument. The measured value for each target analyte should be within ± 20 percent (%D) of the true value for the calibration verification check to be acceptable. If a measured value falls outside this range, then the check sample should be reanalyzed. If the value continues to fall outside the acceptance range, the instrument should be recalibrated, and the batch of samples analyzed before the unacceptable calibration verification check must be reanalyzed.

9.5 Precision measurements -- The precision of the method is monitored by analyzing a sample with low, moderate, or high concentrations of target analytes. The frequency of precision measurements will depend on the data quality objectives for the data. A minimum of one precision sample should be run per day. Each precision sample should be analyzed 7 times in replicate. It is recommended that precision measurements be obtained for samples with varying concentration ranges to assess the effect of concentration on method precision. Determining method precision for analytes at concentrations near the site action levels can be extremely important if the FPXRF results are to be used in an enforcement action; therefore, selection of at least one sample with target analyte concentrations at or near the site action levels or levels of concern is recommended. A precision sample is analyzed by the instrument for the same field analysis time as used for other project samples. The relative standard deviation (RSD) of the sample mean is used to assess method precision. For FPXRF data to be considered adequately precise, the RSD should not be greater than 20 percent with the exception of chromium. RSD values for chromium should not be greater than 30 percent. If both in situ and intrusive analytical techniques are used during the course of one day, it is recommended that separate precision calculations be performed for each analysis type.

The equation for calculating RSD is as follows:

$$\text{RSD} = (\text{SD}/\text{Mean Concentration}) \times 100$$

where:

RSD = Relative standard deviation for the precision measurement for the analyte
SD = Standard deviation of the concentration for the analyte
Mean concentration = Mean concentration for the analyte

The precision or reproducibility of a measurement will improve with increasing count time, however, increasing the count time by a factor of 4 will provide only 2 times better precision, so there is a point of diminishing return. Increasing the count time also improves the sensitivity, but decreases sample throughput.

9.6 The lower limits of detection should be established from actual measured performance based on spike recoveries in the matrix of concern or from acceptable method performance on a certified reference material of the appropriate matrix and within the appropriate calibration range for the application. This is considered the best estimate of the true method sensitivity as opposed to a statistical determination based on the standard deviation of

replicate analyses of a low-concentration sample. While the statistical approach demonstrates the potential data variability for a given sample matrix at one point in time, it does not represent what can be detected or most importantly the lowest concentration that can be calibrated. For this reason the sensitivity should be established as the lowest point of detection based on acceptable target analyte recovery in the desired sample matrix.

9.7 Confirmatory samples – The comparability of the FPXRF analysis is determined by submitting FPXRF-analyzed samples for analysis at a laboratory. The method of confirmatory analysis must meet the project and XRF measurement data quality objectives. The confirmatory samples must be splits of the well homogenized sample material. In some cases the prepared sample cups can be submitted. A minimum of 1 sample for each 20 FPXRF-analyzed samples should be submitted for confirmatory analysis. This frequency will depend on project-specific data quality objectives. The confirmatory analyses can also be used to verify the quality of the FPXRF data. The confirmatory samples should be selected from the lower, middle, and upper range of concentrations measured by the FPXRF. They should also include samples with analyte concentrations at or near the site action levels. The results of the confirmatory analysis and FPXRF analyses should be evaluated with a least squares linear regression analysis. If the measured concentrations span more than one order of magnitude, the data should be log-transformed to standardize variance which is proportional to the magnitude of measurement. The correlation coefficient (r) for the results should be 0.7 or greater for the FPXRF data to be considered screening level data. If the r is 0.9 or greater and inferential statistics indicate the FPXRF data and the confirmatory data are statistically equivalent at a 99 percent confidence level, the data could potentially meet definitive level data criteria.

10.0 CALIBRATION AND STANDARDIZATION

10.1 Instrument calibration – Instrument calibration procedures vary among FPXRF instruments. Users of this method should follow the calibration procedures outlined in the operator's manual for each specific FPXRF instrument. Generally, however, three types of calibration procedures exist for FPXRF instruments, namely: FP calibration, empirical calibration, and the Compton peak ratio or normalization method. These three types of calibration are discussed below.

10.2 Fundamental parameters calibration -- FP calibration procedures are extremely variable. An FP calibration provides the analyst with a "standardless" calibration. The advantages of FP calibrations over empirical calibrations include the following:

- No previously collected site-specific samples are necessary, although site-specific samples with confirmed and validated analytical results for all elements present could be used.
- Cost is reduced because fewer confirmatory laboratory results or calibration standards are necessary.

However, the analyst should be aware of the limitations imposed on FP calibration by particle size and matrix effects. These limitations can be minimized by adhering to the preparation procedure described in Sec. 7.3. The two FP calibration processes discussed below are based on an effective energy FP routine and a back scatter with FP (BFP) routine. Each FPXRF FP calibration process is based on a different iterative algorithmic method. The calibration procedure for each routine is explained in detail in the manufacturer's user manual for each FPXRF instrument; in addition, training courses are offered for each instrument.

10.2.1 Effective energy FP calibration – The effective energy FP calibration is performed by the manufacturer before an instrument is sent to the analyst. Although SSCS can be used, the calibration relies on pure element standards or SRMs such as those obtained from NIST for the FP calibration. The effective energy routine relies on the spectrometer response to pure elements and FP iterative algorithms to compensate for various matrix effects.

Alpha coefficients are calculated using a variation of the Sherman equation, which calculates theoretical intensities from the measurement of pure element samples. These coefficients indicate the quantitative effect of each matrix element on an analyte's measured x-ray intensity. Next, the Lachance Trill algorithm is solved as a set of simultaneous equations based on the theoretical intensities. The alpha coefficients are then downloaded into the specific instrument.

The working effective energy FP calibration curve must be verified before sample analysis begins on each working day, after every 20 samples are analyzed, and at the end of sampling. This verification is performed by analyzing either an NIST SRM or an SSCS that is representative of the site-specific samples. This SRM or SSCS serves as a calibration check. A manufacturer-recommended count time per source should be used for the calibration check. The analyst must then adjust the y-intercept and slope of the calibration curve to best fit the known concentrations of target analytes in the SRM or SSCS.

A percent difference (%D) is then calculated for each target analyte. The %D should be within ± 20 percent of the certified value for each analyte. If the %D falls outside this acceptance range, then the calibration curve should be adjusted by varying the slope of the line or the y-intercept value for the analyte. The SRM or SSCS is reanalyzed until the %D falls within ± 20 percent. The group of 20 samples analyzed before an out-of-control calibration check should be reanalyzed.

The equation to calibrate %D is as follows:

$$\%D = ((C_s - C_k) / C_k) \times 100$$

where:

%D = Percent difference

C_k = Certified concentration of standard sample

C_s = Measured concentration of standard sample

10.2.2 BFP calibration – BFP calibration relies on the ability of the liquid nitrogen-cooled, Si(Li) solid-state detector to separate the coherent (Compton) and incoherent (Rayleigh) backscatter peaks of primary radiation. These peak intensities are known to be a function of sample composition, and the ratio of the Compton to Rayleigh peak is a function of the mass absorption of the sample. The calibration procedure is explained in detail in the instrument manufacturer's manual. Following is a general description of the BFP calibration procedure.

The concentrations of all detected and quantified elements are entered into the computer software system. Certified element results for an NIST SRM or confirmed and validated results for an SSCS can be used. In addition, the concentrations of oxygen and silicon must be entered; these two concentrations are not found in standard metals analyses. The manufacturer provides silicon and oxygen concentrations for typical soil types. Pure element standards are then analyzed using a manufacturer-recommended

count time per source. The results are used to calculate correction factors in order to adjust for spectrum overlap of elements.

The working BFP calibration curve must be verified before sample analysis begins on each working day, after every 20 samples are analyzed, and at the end of the analysis. This verification is performed by analyzing either an NIST SRM or an SSCS that is representative of the site-specific samples. This SRM or SSCS serves as a calibration check. The standard sample is analyzed using a manufacturer-recommended count time per source to check the calibration curve. The analyst must then adjust the y-intercept and slope of the calibration curve to best fit the known concentrations of target analytes in the SRM or SSCS.

A %D is then calculated for each target analyte. The %D should fall within ± 20 percent of the certified value for each analyte. If the %D falls outside this acceptance range, then the calibration curve should be adjusted by varying the slope of the line the y-intercept value for the analyte. The standard sample is reanalyzed until the %D falls within ± 20 percent. The group of 20 samples analyzed before an out-of-control calibration check should be reanalyzed.

10.3 Empirical calibration -- An empirical calibration can be performed with SSCS, site-typical standards, or standards prepared from metal oxides. A discussion of SSCS is included in Sec. 7.3; if no previously characterized samples exist for a specific site, site-typical standards can be used. Site-typical standards may be selected from commercially available characterized soils or from SSCS prepared for another site. The site-typical standards should closely approximate the site's soil matrix with respect to particle size distribution, mineralogy, and contaminant analytes. If neither SSCS nor site-typical standards are available, it is possible to make gravimetric standards by adding metal oxides to a "clean" sand or silicon dioxide matrix that simulates soil. Metal oxides can be purchased from various chemical vendors. If standards are made on site, a balance capable of weighing items to at least two decimal places is necessary. Concentrated ICP or AA standard solutions can also be used to make standards. These solutions are available in concentrations of 10,000 parts per million, thus only small volumes have to be added to the soil.

An empirical calibration using SSCS involves analysis of SSCS by the FPXRF instrument and by a conventional analytical method such as ICP or AA. A total acid digestion procedure should be used by the laboratory for sample preparation. Generally, a minimum of 10 and a maximum of 30 well characterized SSCS, site-typical standards, or prepared metal oxide standards are necessary to perform an adequate empirical calibration. The exact number of standards depends on the number of analytes of interest and interfering elements. Theoretically, an empirical calibration with SSCS should provide the most accurate data for a site because the calibration compensates for site-specific matrix effects.

The first step in an empirical calibration is to analyze the pure element standards for the elements of interest. This enables the instrument to set channel limits for each element for spectral deconvolution. Next the SSCS, site-typical standards, or prepared metal oxide standards are analyzed using a count time of 200 seconds per source or a count time recommended by the manufacturer. This will produce a spectrum and net intensity of each analyte in each standard. The analyte concentrations for each standard are then entered into the instrument software; these concentrations are those obtained from the laboratory, the certified results, or the gravimetrically determined concentrations of the prepared standards. This gives the instrument analyte values to regress against corresponding intensities during the modeling stage. The regression equation correlates the concentrations of an analyte with its net intensity.

The calibration equation is developed using a least squares fit regression analysis. After the regression terms to be used in the equation are defined, a mathematical equation can be developed to calculate the analyte concentration in an unknown sample. In some FPXRF instruments, the software of the instrument calculates the regression equation. The software uses calculated intercept and slope values to form a multiterm equation. In conjunction with the software in the instrument, the operator can adjust the multiterm equation to minimize interelement interferences and optimize the intensity calibration curve.

It is possible to define up to six linear or nonlinear terms in the regression equation. Terms can be added and deleted to optimize the equation. The goal is to produce an equation with the smallest regression error and the highest correlation coefficient. These values are automatically computed by the software as the regression terms are added, deleted, or modified. It is also possible to delete data points from the regression line if these points are significant outliers or if they are heavily weighing the data. Once the regression equation has been selected for an analyte, the equation can be entered into the software for quantitation of analytes in subsequent samples. For an empirical calibration to be acceptable, the regression equation for a specific analyte should have a correlation coefficient of 0.98 or greater or meet the DQOs of the project.

In an empirical calibration, one must apply the DQOs of the project and ascertain critical or action levels for the analytes of interest. It is within these concentration ranges or around these action levels that the FPXRF instrument should be calibrated most accurately. It may not be possible to develop a good regression equation over several orders of analyte concentration.

10.4 Compton normalization method – The Compton normalization method is based on analysis of a single, certified standard and normalization for the Compton peak. The Compton peak is produced from incoherent backscattering of x-ray radiation from the excitation source and is present in the spectrum of every sample. The Compton peak intensity changes with differing matrices. Generally, matrices dominated by lighter elements produce a larger Compton peak, and those dominated by heavier elements produce a smaller Compton peak. Normalizing to the Compton peak can reduce problems with varying matrix effects among samples. Compton normalization is similar to the use of internal standards in organics analysis. The Compton normalization method may not be effective when analyte concentrations exceed a few percent.

The certified standard used for this type of calibration could be an NIST SRM such as 2710 or 2711. The SRM must be a matrix similar to the samples and must contain the analytes of interests at concentrations near those expected in the samples. First, a response factor has to be determined for each analyte. This factor is calculated by dividing the net peak intensity by the analyte concentration. The net peak intensity is gross intensity corrected for baseline reading. Concentrations of analytes in samples are then determined by multiplying the baseline corrected analyte signal intensity by the normalization factor and by the response factor. The normalization factor is the quotient of the baseline corrected Compton K_{α} peak intensity of the SRM divided by that of the samples. Depending on the FPXRF instrument used, these calculations may be done manually or by the instrument software.

11.0 PROCEDURE

11.1 Operation of the various FPXRF instruments will vary according to the manufacturers' protocols. Before operating any FPXRF instrument, one should consult the manufacturer's manual. Most manufacturers recommend that their instruments be allowed to warm up for 15 to 30 minutes before analysis of samples. This will help alleviate drift or energy calibration problems later during analysis.

11.2 Each FPXRF instrument should be operated according to the manufacturer's recommendations. There are two modes in which FPXRF instruments can be operated: in situ and intrusive. The in situ mode involves analysis of an undisturbed soil sediment or sample. Intrusive analysis involves collection and preparation of a soil or sediment sample before analysis. Some FPXRF instruments can operate in both modes of analysis, while others are designed to operate in only one mode. The two modes of analysis are discussed below.

11.3 For in situ analysis, remove any large or nonrepresentative debris from the soil surface before analysis. This debris includes rocks, pebbles, leaves, vegetation, roots, and concrete. Also, the soil surface must be as smooth as possible so that the probe window will have good contact with the surface. This may require some leveling of the surface with a stainless-steel trowel. During the study conducted to provide example performance data for this method, this modest amount of sample preparation was found to take less than 5 min per sample location. The last requirement is that the soil or sediment not be saturated with water. Manufacturers state that their FPXRF instruments will perform adequately for soils with moisture contents of 5 to 20 percent but will not perform well for saturated soils, especially if ponded water exists on the surface. Another recommended technique for in situ analysis is to tamp the soil to increase soil density and compactness for better repeatability and representativeness. This condition is especially important for heavy element analysis, such as barium. Source count times for in situ analysis usually range from 30 to 120 seconds, but source count times will vary among instruments and depending on the desired method sensitivity. Due to the heterogeneous nature of the soil sample, in situ analysis can provide only "screening" type data.

11.4 For intrusive analysis of surface or sediment, it is recommended that a sample be collected from a 4- by 4-inch square that is 1 inch deep. This will produce a soil sample of approximately 375 g or 250 cm³, which is enough soil to fill an 8-ounce jar. However, the exact dimensions and sample depth should take into consideration the heterogeneous deposition of contaminants and will ultimately depend on the desired project-specific data quality objectives. The sample should be homogenized, dried, and ground before analysis. The sample can be homogenized before or after drying. The homogenization technique to be used after drying is discussed in Sec. 4.2. If the sample is homogenized before drying, it should be thoroughly mixed in a beaker or similar container, or if the sample is moist and has a high clay content, it can be kneaded in a plastic bag. One way to monitor homogenization when the sample is kneaded in a plastic bag is to add sodium fluorescein dye to the sample. After the moist sample has been homogenized, it is examined under an ultraviolet light to assess the distribution of sodium fluorescein throughout the sample. If the fluorescent dye is evenly distributed in the sample, homogenization is considered complete; if the dye is not evenly distributed, mixing should continue until the sample has been thoroughly homogenized. During the study conducted to provide data for this method, the time necessary for homogenization procedure using the fluorescein dye ranged from 3 to 5 min per sample. As demonstrated in Secs. 13.5 and 13.7, homogenization has the greatest impact on the reduction of sampling variability. It produces little or no contamination. Often, the direct analysis through the plastic bag is possible without the more labor intensive steps of drying, grinding, and sieving given in Secs. 11.5 and 11.6. Of course, to achieve the best data quality possible all four steps should be followed.

11.5 Once the soil or sediment sample has been homogenized, it should be dried. This can be accomplished with a toaster oven or convection oven. A small aliquot of the sample (20 to 50 g) is placed in a suitable container for drying. The sample should be dried for 2 to 4 hr in the convection or toaster oven at a temperature not greater than 150 °C. Samples may also be air dried under ambient temperature conditions using a 10- to 20-g portion. Regardless of what drying mechanism is used, the drying process is considered complete when a constant sample weight can be obtained. Care should be taken to avoid sample cross-contamination and these measures can be evaluated by including an appropriate method blank sample along with any sample preparation process.

CAUTION: Microwave drying is not a recommended procedure. Field studies have shown that microwave drying can increase variability between the FPXRF data and confirmatory analysis. High levels of metals in a sample can cause arcing in the microwave oven, and sometimes slag forms in the sample. Microwave oven drying can also melt plastic containers used to hold the sample.

11.6 The homogenized dried sample material should be ground with a mortar and pestle and passed through a 60-mesh sieve to achieve a uniform particle size. Sample grinding should continue until at least 90 percent of the original sample passes through the sieve. The grinding step normally takes an average of 10 min per sample. An aliquot of the sieved sample should then be placed in a 31.0-mm polyethylene sample cup (or equivalent) for analysis. The sample cup should be one-half to three-quarters full at a minimum. The sample cup should be covered with a 2.5 µm Mylar (or equivalent) film for analysis. The rest of the soil sample should be placed in a jar, labeled, and archived for possible confirmation analysis. All equipment including the mortar, pestle, and sieves must be thoroughly cleaned so that any cross-contamination is below the established lower limit of detection of the procedure or DQOs of the analysis. If all recommended sample preparation steps are followed, there is a high probability the desired laboratory data quality may be obtained.

12.0 DATA ANALYSIS AND CALCULATIONS

Most FPXRF instruments have software capable of storing all analytical results and spectra. The results are displayed in ppm and can be downloaded to a personal computer, which can be used to provide a hard copy printout. Individual measurements that are smaller than three times their associated SD should not be used for quantitation. See the manufacturer's instructions regarding data analysis and calculations.

13.0 METHOD PERFORMANCE

13.1 Performance data and related information are provided in SW-846 methods only as examples and guidance. The data do not represent required performance criteria for users of the methods. Instead, performance criteria should be developed on a project-specific basis, and the laboratory should establish in-house QC performance criteria for the application of this method. These performance data are not intended to be and must not be used as absolute QC acceptance criteria for purposes of laboratory accreditation.

13.2 The sections to follow discuss three performance evaluation factors; namely, precision, accuracy, and comparability. The example data presented in Tables 4 through 8 were generated from results obtained from six FPXRF instruments (see Sec. 13.3). The soil samples analyzed by the six FPXRF instruments were collected from two sites in the United States. The soil samples contained several of the target analytes at concentrations ranging from "nondetect" to tens of thousands of mg/kg. These data are provided for guidance purposes only.

13.3 The six FPXRF instruments included the TN 9000 and TN Lead Analyzer manufactured by TN Spectrace; the X-MET 920 with a SiLi detector and X-MET 920 with a gas-filled proportional detector manufactured by Metorex, Inc.; the XL Spectrum Analyzer manufactured by Niton; and the MAP Spectrum Analyzer manufactured by Scitec. The TN 9000 and TN Lead Analyzer both have a Hg₂ detector. The TN 9000 utilized an Fe-55, Cd-109, and Am-241 source. The TN Lead Analyzer had only a Cd-109 source. The X-Met 920 with the SiLi detector had a Cd-109 and Am-241 source. The X-MET 920 with the gas-filled proportional detector had only a Cd-109 source. The XL Spectrum Analyzer utilized a silicon pin-diode

detector and a Cd-109 source. The MAP Spectrum Analyzer utilized a solid-state silicon detector and a Cd-109 source.

13.4 All example data presented in Tables 4 through 8 were generated using the following calibrations and source count times. The TN 9000 and TN Lead Analyzer were calibrated using fundamental parameters using NIST SRM 2710 as a calibration check sample. The TN 9000 was operated using 100, 60, and 60 second count times for the Cd-109, Fe-55, and Am-241 sources, respectively. The TN Lead analyzer was operated using a 60 second count time for the Cd-109 source. The X-MET 920 with the Si(Li) detector was calibrated using fundamental parameters and one well characterized site-specific soil standard as a calibration check. It used 140 and 100 second count times for the Cd-109 and Am-241 sources, respectively. The X-MET 920 with the gas-filled proportional detector was calibrated empirically using between 10 and 20 well characterized site-specific soil standards. It used 120 second times for the Cd-109 source. The XL Spectrum Analyzer utilized NIST SRM 2710 for calibration and the Compton peak normalization procedure for quantitation based on 60 second count times for the Cd-109 source. The MAP Spectrum Analyzer was internally calibrated by the manufacturer. The calibration was checked using a well-characterized site-specific soil standard. It used 240 second times for the Cd-109 source.

13.5 Precision measurements – The example precision data are presented in Table 4. These data are provided for guidance purposes only. Each of the six FPXRF instruments performed 10 replicate measurements on 12 soil samples that had analyte concentrations ranging from "nondetects" to thousands of mg/kg. Each of the 12 soil samples underwent 4 different preparation techniques from in situ (no preparation) to dried and ground in a sample cup. Therefore, there were 48 precision data points for five of the instruments and 24 precision points for the MAP Spectrum Analyzer. The replicate measurements were taken using the source count times discussed at the beginning of this section.

For each detectable analyte in each precision sample a mean concentration, standard deviation, and RSD was calculated for each analyte. The data presented in Table 4 is an average RSD for the precision samples that had analyte concentrations at 5 to 10 times the lower limit of detection for that analyte for each instrument. Some analytes such as mercury, selenium, silver, and thorium were not detected in any of the precision samples so these analytes are not listed in Table 4. Some analytes such as cadmium, nickel, and tin were only detected at concentrations near the lower limit of detection so that an RSD value calculated at 5 to 10 times this limit was not possible.

One FPXRF instrument collected replicate measurements on an additional nine soil samples to provide a better assessment of the effect of sample preparation on precision. Table 5 shows these results. These data are provided for guidance purposes only. The additional nine soil samples were comprised of three from each texture and had analyte concentrations ranging from near the lower limit of detection for the FPXRF analyzer to thousands of mg/kg. The FPXRF analyzer only collected replicate measurements from three of the preparation methods; no measurements were collected from the in situ homogenized samples. The FPXRF analyzer conducted five replicate measurements of the in situ field samples by taking measurements at five different points within the 4-inch by 4-inch sample square. Ten replicate measurements were collected for both the intrusive undried and unground and intrusive dried and ground samples contained in cups. The cups were shaken between each replicate measurement.

Table 5 shows that the precision dramatically improved from the in situ to the intrusive measurements. In general there was a slight improvement in precision when the sample was dried and ground. Two factors caused the precision for the in situ measurements to be poorer. The major factor is soil heterogeneity. By moving the probe within the 4-inch by 4-inch square,

measurements of different soil samples were actually taking place within the square. Table 5 illustrates the dominant effect of soil heterogeneity. It overwhelmed instrument precision when the FPXRF analyzer was used in this mode. The second factor that caused the RSD values to be higher for the in situ measurements is the fact that only five instead of ten replicates were taken. A lesser number of measurements caused the standard deviation to be larger which in turn elevated the RSD values.

13.6 Accuracy measurements -- Five of the FPXRF instruments (not including the MAP Spectrum Analyzer) analyzed 18 SRMs using the source count times and calibration methods given at the beginning of this section. The 18 SRMs included 9 soil SRMs, 4 stream or river sediment SRMs, 2 sludge SRMs, and 3 ash SRMs. Each of the SRMs contained known concentrations of certain target analytes. A percent recovery was calculated for each analyte in each SRM for each FPXRF instrument. Table 6 presents a summary of this data. With the exception of cadmium, chromium, and nickel, the values presented in Table 6 were generated from the 13 soil and sediment SRMs only. The 2 sludge and 3 ash SRMs were included for cadmium, chromium, and nickel because of the low or nondetectable concentrations of these three analytes in the soil and sediment SRMs.

Only 12 analytes are presented in Table 6. These are the analytes that are of environmental concern and provided a significant number of detections in the SRMs for an accuracy assessment. No data is presented for the X-MET 920 with the gas-filled proportional detector. This FPXRF instrument was calibrated empirically using site-specific soil samples. The percent recovery values from this instrument were very sporadic and the data did not lend itself to presentation in Table 6.

Table 7 provides a more detailed summary of accuracy data for one particular FPXRF instrument (TN 9000) for the 9 soil SRMs and 4 sediment SRMs. These data are provided for guidance purposes only. Table 7 shows the certified value, measured value, and percent recovery for five analytes. These analytes were chosen because they are of environmental concern and were most prevalently certified for in the SRM and detected by the FPXRF instrument. The first nine SRMs are soil and the last 4 SRMs are sediment. Percent recoveries for the four NIST SRMs were often between 90 and 110 percent for all analytes.

13.7 Comparability -- Comparability refers to the confidence with which one data set can be compared to another. In this case, FPXRF data generated from a large study of six FPXRF instruments was compared to SW-846 Methods 3050 and 6010 which are the standard soil extraction for metals and analysis by inductively coupled plasma. An evaluation of comparability was conducted by using linear regression analysis. Three factors were determined using the linear regression. These factors were the y-intercept, the slope of the line, and the coefficient of determination (r^2).

As part of the comparability assessment, the effects of soil type and preparation methods were studied. Three soil types (textures) and four preparation methods were examined during the study. The preparation methods evaluated the cumulative effect of particle size, moisture, and homogenization on comparability. Due to the large volume of data produced during this study, linear regression data for six analytes from only one FPXRF instrument is presented in Table 8. Similar trends in the data were seen for all instruments. These data are provided for guidance purposes only.

Table 8 shows the regression parameters for the whole data set, broken out by soil type, and by preparation method. These data are provided for guidance purposes only. The soil types are as follows: soil 1--sand; soil 2--loam; and soil 3--silty clay. The preparation methods are as follows: preparation 1--in situ in the field; preparation 2--intrusive, sample collected and homogenized; preparation 3--intrusive, with sample in a sample cup but sample still wet and not

ground; and preparation 4—intrusive, with sample dried, ground, passed through a 40-mesh sieve, and placed in sample cup.

For arsenic, copper, lead, and zinc, the comparability to the confirmatory laboratory was excellent with r^2 values ranging from 0.80 to 0.99 for all six FPXRF instruments. The slopes of the regression lines for arsenic, copper, lead, and zinc, were generally between 0.90 and 1.00 indicating the data would need to be corrected very little or not at all to match the confirmatory laboratory data. The r^2 values and slopes of the regression lines for barium and chromium were not as good as for the other for analytes, indicating the data would have to be corrected to match the confirmatory laboratory.

Table 8 demonstrates that there was little effect of soil type on the regression parameters for any of the six analytes. The only exceptions were for barium in soil 1 and copper in soil 3. In both of these cases, however, it is actually a concentration effect and not a soil effect causing the poorer comparability. All barium and copper concentrations in soil 1 and 3, respectively, were less than 350 mg/kg.

Table 8 shows there was a preparation effect on the regression parameters for all six analytes. With the exception of chromium, the regression parameters were primarily improved going from preparation 1 to preparation 2. In this step, the sample was removed from the soil surface, all large debris was removed, and the sample was thoroughly homogenized. The additional two preparation methods did little to improve the regression parameters. This data indicates that homogenization is the most critical factor when comparing the results. It is essential that the sample sent to the confirmatory laboratory match the FPXRF sample as closely as possible.

Sec. 11.0 of this method discusses the time necessary for each of the sample preparation techniques. Based on the data quality objectives for the project, an analyst must decide if it is worth the extra time necessary to dry and grind the sample for small improvements in comparability. Homogenization requires 3 to 5 min. Drying the sample requires one to two hours. Grinding and sieving requires another 10 to 15 min per sample. Lastly, when grinding and sieving is conducted, time has to be allotted to decontaminate the mortars, pestles, and sieves. Drying and grinding the samples and decontamination procedures will often dictate that an extra person be on site so that the analyst can keep up with the sample collection crew. The cost of requiring an extra person on site to prepare samples must be balanced with the gain in data quality and sample throughput.

13.8 The following documents may provide additional guidance and insight on this method and technique:

13.8.1 A. D. Hewitt, "Screening for Metals by X-ray Fluorescence Spectrometry/Response Factor/Compton K_{α} Peak Normalization Analysis," American Environmental Laboratory, pp 24-32, 1994.

13.8.2 S. Piorek and J. R. Pasmore, "Standardless, In Situ Analysis of Metallic Contaminants in the Natural Environment With a PC-Based, High Resolution Portable X-Ray Analyzer," Third International Symposium on Field Screening Methods for Hazardous Waste and Toxic Chemicals, Las Vegas, Nevada, February 24-26, 1993, Vol 2, pp 1135-1151, 1993.

13.8.3 S. Shefsky, "Sample Handling Strategies for Accurate Lead-in-soil Measurements in the Field and Laboratory," *International Symposium of Field Screening Methods for Hazardous Waste and Toxic Chemicals*, Las Vegas, NV, January 29-31, 1997.

14.0 POLLUTION PREVENTION

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity and/or toxicity of waste at the point of generation. Numerous opportunities for pollution prevention exist in laboratory operation. The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation. When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option.

14.2 For information about pollution prevention that may be applicable to laboratories and research institutions consult *Less is Better: Laboratory Chemical Management for Waste Reduction* available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th St., N.W. Washington, D.C. 20036, <http://www.acs.org>.

15.0 WASTE MANAGEMENT

The Environmental Protection Agency requires that laboratory waste management practices be conducted consistent with all applicable rules and regulations. The Agency urges laboratories to protect the air, water, and land by minimizing and controlling all releases from hoods and bench operations, complying with the letter and spirit of any sewer discharge permits and regulations, and by complying with all solid and hazardous waste regulations, particularly the hazardous waste identification rules and land disposal restrictions. For further information on waste management, consult *The Waste Management Manual for Laboratory Personnel* available from the American Chemical Society at the address listed in Sec. 14.2.

16.0 REFERENCES

1. Metorex, X-MET 920 User's Manual.
2. Spectrace Instruments, "Energy Dispersive X-ray Fluorescence Spectrometry: An Introduction," 1994.
3. TN Spectrace, Spectrace 9000 Field Portable/Benchtop XRF Training and Applications Manual.
4. Unpublished SITE data, received from PRC Environment Management, Inc.

17.0 TABLES, DIAGRAMS, FLOWCHARTS, AND VALIDATION DATA

The following pages contain the tables referenced by this method. A flow diagram of the procedure follows the tables.

TABLE 1

EXAMPLE INTERFERENCE FREE LOWER LIMITS OF DETECTION

Analyte	Chemical Abstract Series Number	Lower Limit of Detection in Quartz Sand (milligrams per kilogram)
Antimony (Sb)	7440-36-0	40
Arsenic (As)	7440-38-0	40
Barium (Ba)	7440-39-3	20
Cadmium (Cd)	7440-43-9	100
Calcium (Ca)	7440-70-2	70
Chromium (Cr)	7440-47-3	150
Cobalt (Co)	7440-48-4	60
Copper (Cu)	7440-50-8	50
Iron (Fe)	7439-89-6	60
Lead (Pb)	7439-92-1	20
Manganese (Mn)	7439-96-5	70
Mercury (Hg)	7439-97-6	30
Molybdenum (Mo)	7439-93-7	10
Nickel (Ni)	7440-02-0	50
Potassium (K)	7440-09-7	200
Rubidium (Rb)	7440-17-7	10
Selenium (Se)	7782-49-2	40
Silver (Ag)	7440-22-4	70
Strontium (Sr)	7440-24-6	10
Thallium (Tl)	7440-28-0	20
Thorium (Th)	7440-29-1	10
Tin (Sn)	7440-31-5	60
Titanium (Ti)	7440-32-6	50
Vanadium (V)	7440-62-2	50
Zinc (Zn)	7440-66-6	50
Zirconium (Zr)	7440-67-7	10

Source: Refs. 1, 2, and 3
 These data are provided for guidance purposes only.

TABLE 2
SUMMARY OF RADIOISOTOPE SOURCE CHARACTERISTICS

Source	Activity (mCi)	Half-Life (Years)	Excitation Energy (keV)	Elemental Analysis Range	
Fe-55	20-50	2.7	5.9	Sulfur to Chromium Molybdenum to Barium	K Lines L Lines
Cd-109	5-30	1.3	22.1 and 87.9	Calcium to Rhodium Tantalum to Lead Barium to Uranium	K Lines K Lines L Lines
Am-241	5-30	432	26.4 and 59.6	Copper to Thulium Tungsten to Uranium	K Lines L Lines
Cm-244	60-100	17.8	14.2	Titanium to Selenium Lanthanum to Lead	K Lines L Lines

Source: Refs. 1, 2, and 3

TABLE 3
SUMMARY OF X-RAY TUBE SOURCE CHARACTERISTICS

Anode Material	Recommended Voltage Range (kV)	K-alpha Emission (keV)	Elemental Analysis Range	
Cu	18-22	8.04	Potassium to Cobalt Silver to Gadolinium	K Lines L Lines
Mo	40-50	17.4	Cobalt to Yttrium Europium to Radon	K Lines L Lines
Ag	50-65	22.1	Zinc to Technicium Ytterbium to Neptunium	K Lines L Lines

Source: Ref. 4

Notes: The sample elements excited are chosen by taking as the lower limit the same ratio of excitation line energy to element absorption edge as in Table 2 (approximately 0.45) and the requirement that the excitation line energy be above the element absorption edge as the upper limit (L2 edges used for L lines). K-beta excitation lines were ignored.

TABLE 4
EXAMPLE PRECISION VALUES

Analyte	Average Relative Standard Deviation for Each Instrument at 5 to 10 Times the Lower Limit of Detection					
	TN 9000	TN Lead Analyzer	X-MET 920 (SiLi Detector)	X-MET 920 (Gas-Filled Detector)	XL Spectrum Analyzer	MAP Spectrum Analyzer
Antimony	6.54	NR	NR	NR	NR	NR
Arsenic	5.33	4.11	3.23	1.91	12.47	6.68
Barium	4.02	NR	3.31	5.91	NR	NR
Cadmium	29.84 ^a	NR	24.80 ^a	NR	NR	NR
Calcium	2.16	NR	NR	NR	NR	NR
Chromium	22.25	25.78	22.72	3.91	30.25	NR
Cobalt	33.90	NR	NR	NR	NR	NR
Copper	7.03	9.11	8.49	9.12	12.77	14.86
Iron	1.78	1.67	1.55	NR	2.30	NR
Lead	6.45	5.93	5.05	7.56	6.97	12.16
Manganese	27.04	24.75	NR	NR	NR	NR
Molybdenum	6.95	NR	NR	NR	12.60	NR
Nickel	30.85 ^a	NR	24.92 ^a	20.92 ^a	NA	NR
Potassium	3.90	NR	NR	NR	NR	NR
Rubidium	13.06	NR	NR	NR	32.69 ^a	NR
Strontium	4.28	NR	NR	NR	8.86	NR
Tin	24.32 ^a	NR	NR	NR	NR	NR
Titanium	4.87	NR	NR	NR	NR	NR
Zinc	7.27	7.48	4.26	2.28	10.95	0.83
Zirconium	3.58	NR	NR	NR	6.49	NR

These data are provided for guidance purposes only.

Source: Ref. 4

^a These values are biased high because the concentration of these analytes in the soil samples was near the lower limit of detection for that particular FPXRF instrument.

NR Not reported.

NA Not applicable; analyte was reported but was below the established lower limit detection.

TABLE 5

EXAMPLES OF PRECISION AS AFFECTED BY SAMPLE PREPARATION

Analyte	Average Relative Standard Deviation for Each Preparation Method		
	In Situ-Field	Intrusive-Undried and Unground	Intrusive-Dried and Ground
Antimony	30.1	15.0	14.4
Arsenic	22.5	5.36	3.76
Barium	17.3	3.38	2.90
Cadmium ^a	41.2	30.8	28.3
Calcium	17.5	1.68	1.24
Chromium	17.6	28.5	21.9
Cobalt	28.4	31.1	28.4
Copper	26.4	10.2	7.90
Iron	10.3	1.67	1.57
Lead	25.1	8.55	6.03
Manganese	40.5	12.3	13.0
Mercury	ND	ND	ND
Molybdenum	21.6	20.1	19.2
Nickel ^a	29.8	20.4	18.2
Potassium	18.6	3.04	2.57
Rubidium	29.8	16.2	18.9
Selenium	ND	20.2	19.5
Silver ^a	31.9	31.0	29.2
Strontium	15.2	3.38	3.98
Thallium	39.0	16.0	19.5
Thorium	NR	NR	NR
Tin	ND	14.1	15.3
Titanium	13.3	4.15	3.74
Vanadium	NR	NR	NR
Zinc	26.6	13.3	11.1
Zirconium	20.2	5.63	5.18

These data are provided for guidance purposes only.

Source: Ref. 4

^a These values may be biased high because the concentration of these analytes in the soil samples was near the lower limit of detection.

ND Not detected.

NR Not reported.

TABLE 6
EXAMPLE ACCURACY VALUES

Analyte	Instrument															
	TN 9000				TN Lead Analyzer				X-MET 920 (SiLi Detector)				XL Spectrum Analyzer			
	n	Range of % Rec.	Mean % Rec.	SD	n	Range of % Rec.	Mean % Rec.	SD	n	Range of % Rec.	Mean % Rec.	SD	n	Range of % Rec.	Mean % Rec.	SD
Sb	2	100-149	124.3	NA	--	--	--	--	--	--	--	--	--	--	--	--
As	5	68-115	92.8	17.3	5	44-105	83.4	23.2	4	9.7-91	47.7	39.7	5	38-535	189.8	206
Ba	9	98-198	135.3	36.9	--	--	--	--	9	18-848	168.2	262	--	--	--	--
Cd	2	99-129	114.3	NA	--	--	--	--	6	81-202	110.5	45.7	--	--	--	--
Cr	2	99-178	138.4	NA	--	--	--	--	7	22-273	143.1	93.8	3	98-625	279.2	300
Cu	8	61-140	95.0	28.8	6	38-107	79.1	27.0	11	10-210	111.8	72.1	8	95-480	203.0	147
Fe	6	78-155	103.7	26.1	6	89-159	102.3	28.6	6	48-94	80.4	16.2	6	26-187	108.6	52.9
Pb	11	66-138	98.9	19.2	11	68-131	97.4	18.4	12	23-94	72.7	20.9	13	80-234	107.3	39.9
Mn	4	81-104	93.1	9.70	3	92-152	113.1	33.8	--	--	--	--	--	--	--	--
Ni	3	99-122	109.8	12.0	--	--	--	--	--	--	--	--	3	57-123	87.5	33.5
Sr	8	110-178	132.6	23.8	--	--	--	--	--	--	--	--	7	86-209	125.1	39.5
Zn	11	41-130	94.3	24.0	10	81-133	100.0	19.7	12	46-181	106.6	34.7	11	31-199	94.6	42.5

Source: Ref. 4. These data are provided for guidance purposes only.

n: Number of samples that contained a certified value for the analyte and produced a detectable concentration from the FPXRF instrument.

SD: Standard deviation; NA: Not applicable; only two data points, therefore, a SD was not calculated.

%Rec.: Percent recovery.

-- No data.

TABLE 7
EXAMPLE ACCURACY FOR TN 9000^a

Standard Reference Material	Arsenic			Barium			Copper			Lead			Zinc		
	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.
RTC CRM-021	24.8	ND	NA	586	1135	193.5	4792	2908	60.7	144742	149947	103.6	546	224	40.9
RTC CRM-020	397	429	92.5	22.3	ND	NA	753	583	77.4	5195	3444	66.3	3022	3916	129.6
BCR CRM 143R	--	--	--	--	--	--	131	105	80.5	180	206	114.8	1055	1043	99.0
BCR CRM 141	--	--	--	--	--	--	32.6	ND	NA	29.4	ND	NA	81.3	ND	NA
USGS GXR-2	25.0	ND	NA	2240	2946	131.5	76.0	106	140.2	690	742	107.6	530	596	112.4
USGS GXR-6	330	294	88.9	1300	2581	198.5	66.0	ND	NA	101	80.9	80.1	118	ND	NA
NIST 2711	105	104	99.3	726	801	110.3	114	ND	NA	1162	1172	100.9	350	333	94.9
NIST 2710	626	722	115.4	707	782	110.6	2950	2834	96.1	5532	5420	98.0	6952	6476	93.2
NIST 2709	17.7	ND	NA	968	950	98.1	34.6	ND	NA	18.9	ND	NA	106	98.5	93.0
NIST 2704	23.4	ND	NA	414	443	107.0	98.6	105	106.2	161	167	103.5	438	427	97.4
CNRC PACS-1	211	143	67.7	--	772	NA	452	302	66.9	404	332	82.3	824	611	74.2
SARM-51	--	--	--	335	466	139.1	268	373	139.2	5200	7199	138.4	2200	2676	121.6
SARM-52	--	--	--	410	527	128.5	219	193	88.1	1200	1107	92.2	264	215	81.4

Source: Ref. 4. These data are provided for guidance purposes only.

^a All concentrations in milligrams per kilogram.

%Rec.: Percent recovery; ND: Not detected; NA: Not applicable.

-- No data.

TABLE 8

EXAMPLE REGRESSION PARAMETERS FOR COMPARABILITY¹

	Arsenic				Barium				Copper			
	n	r ²	Int.	Slope	n	r ²	Int.	Slope	n	r ²	Int.	Slope
All Data	824	0.94	1.62	0.94	1255	0.71	60.3	0.54	984	0.93	2.19	0.93
Soil 1	368	0.96	1.41	0.95	393	0.05	42.6	0.11	385	0.94	1.26	0.99
Soil 2	453	0.94	1.51	0.96	462	0.56	30.2	0.66	463	0.92	2.09	0.95
Soil 3	—	—	—	—	400	0.85	44.7	0.59	136	0.46	16.60	0.57
Prep 1	207	0.87	2.69	0.85	312	0.64	53.7	0.55	256	0.87	3.89	0.87
Prep 2	208	0.97	1.38	0.95	315	0.67	64.6	0.52	246	0.96	2.04	0.93
Prep 3	204	0.96	1.20	0.99	315	0.78	64.6	0.53	236	0.97	1.45	0.99
Prep 4	205	0.96	1.45	0.98	313	0.81	58.9	0.55	246	0.96	1.99	0.96
	Lead				Zinc				Chromium			
	n	r ²	Int.	Slope	n	r ²	Int.	Slope	n	r ²	Int.	Slope
All Data	1205	0.92	1.66	0.95	1103	0.89	1.86	0.95	280	0.70	64.6	0.42
Soil 1	357	0.94	1.41	0.96	329	0.93	1.78	0.93	—	—	—	—
Soil 2	451	0.93	1.62	0.97	423	0.85	2.57	0.90	—	—	—	—
Soil 3	397	0.90	2.40	0.90	351	0.90	1.70	0.98	186	0.66	38.9	0.50
Prep 1	305	0.80	2.88	0.86	286	0.79	3.16	0.87	105	0.80	66.1	0.43
Prep 2	298	0.97	1.41	0.96	272	0.95	1.86	0.93	77	0.51	81.3	0.36
Prep 3	302	0.98	1.26	0.99	274	0.93	1.32	1.00	49	0.73	53.7	0.45
Prep 4	300	0.96	1.38	1.00	271	0.94	1.41	1.01	49	0.75	31.6	0.56

Source: Ref. 4. These data are provided for guidance purposes only.

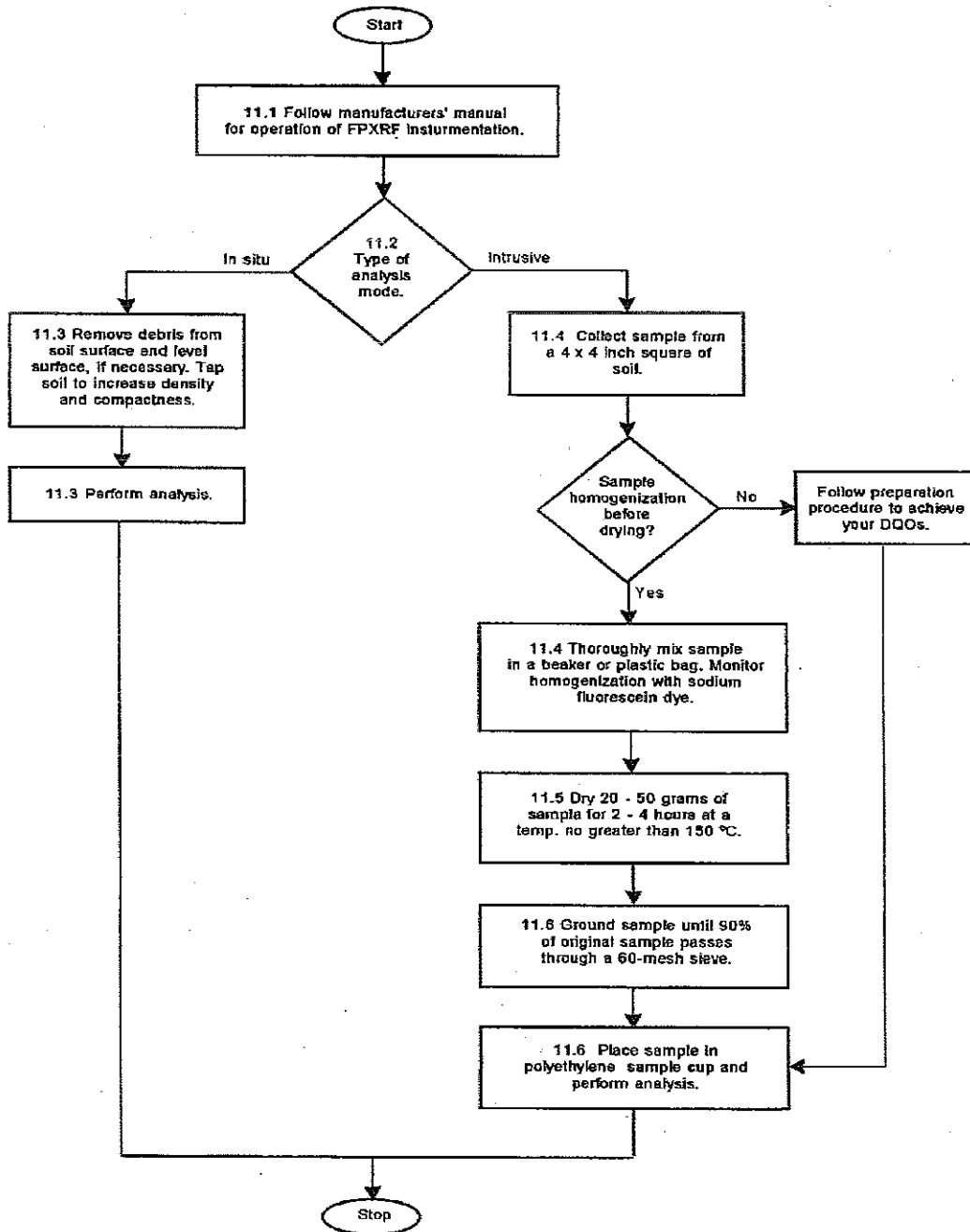
¹ Log-transformed data

n: Number of data points; r²: Coefficient of determination; Int.: Y-intercept

— No applicable data

METHOD 6200

FIELD PORTABLE X-RAY FLUORESCENCE SPECTROMETRY FOR THE DETERMINATION OF ELEMENTAL CONCENTRATIONS IN SOIL AND SEDIMENT



Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Metal piece	Metal piece	Metal piece	H225 - 3"	H225 - 13"	H225 - 26"	H225 - 34"	H209 - 3"
Test Date & Time	8/8/2008 15:10	8/8/2008 15:12	8/8/2008 18:32	8/11/2008 14:55	8/11/2008 14:57	8/11/2008 15:00	8/11/2008 15:01	8/11/2008 15:06
Sampling Mode	In-situ	In-situ	In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	ALLOY	ALLOY	ALLOY	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	30.85	4.29	31.57	60.77	60.76	60.95	61.55	61
Units	%	%	%	ppm	ppm	ppm	ppm	ppm
Antimony	< 0.006	< 0.008	< 0.007	< 484.43	< 340.54	< 355.45	< 252.95	< 241.18
Arsenic				< 7.76	< 8.95	< 11.34	< 10.72	< 7.17
Barium	< 0.017	< 0.028	< 0.017	< 2147.13	< 1316.08	< 1323.71	< 891.76	< 1014.86
Cadmium	< 0.002	< 0.004	< 0.002	< 380.84	< 192.80	< 196.79	< 126.46	< 175.16
Calcium				7410.44	15745.73	9704.87	28672.24	4056.11
Cesium				< 516.51	< 349.26	< 317.45	< 212.27	< 248.94
Chromium	< 0.300	< 0.246	< 0.256	< 32.03	< 33.61	< 32.11	< 37.87	< 31.98
Cobalt	< 0.137	< 0.180	< 0.057	< 139.29	< 150.68	< 187.86	< 209.47	< 113.00
Copper	7.53	0.329	29.806	443.17	523.18	1999.83	782.83	322.64
Iron	30.149	7.309	5.836	13722.01	15754.97	21882.92	28010.16	9879.46
Lead	0.04	< 0.007	0.01	< 10.22	20.98	32.97	37.97	10.21
Manganese	0.304	< 0.158	0.123	177.1	183.09	328.64	348.84	143.91
Mercury	< 0.01	< 0.013	< 0.01	< 9.68	< 10.00	< 11.45	< 11.07	< 9.62
Molybdenum	< 0.045	< 0.018	< 0.043	< 7.44	< 7.30	< 7.97	< 7.62	< 6.83
Nickel	< 0.032	< 0.032	< 0.026	< 61.20	< 61.36	< 68.07	< 66.17	< 51.79
Palladium	< 0.002	< 0.002	< 0.002	< 456.59	< 253.54	< 265.32	< 91.79	< 94.23
Potassium				15986.26	25254.31	36340.84	15377.28	13098.46
Rubidium				46.97	55.16	78.75	36.69	41.56
Scandium				< 27.91	< 39.54	< 33.04	< 54.90	25.29
Selenium	< 0.006	< 0.006	< 0.007	< 4.91	< 4.61	< 5.62	< 5.49	< 4.14
Silver	0.002	< 0.002	0.016	< 310.10	< 145.08	< 165.99	< 73.80	< 122.43
Strontium	NA	NA	NA	79.66	71.34	48.7	86.5	55.01
Sulfur				< 12739.95	< 15615.68	< 14437.27	< 16575.13	< 12351.66
Tellurium				< 1393.83	< 1056.40	< 1001.49	< 651.35	< 712.24
Thorium				10.37	11.41	25.27	12.58	< 8.11
Tin	< 0.005	< 0.008	< 0.006	< 456.61	< 317.67	< 296.24	< 183.62	< 196.15
Titanium	< 0.853	< 1.115	< 0.358	1821.95	2342.75	1869.24	3509.24	1359.77
Tungsten				< 71.64	< 72.78	< 83.23	< 76.13	< 67.34
Uranium	NA	NA	NA	< 10.15	< 11.02	< 13.24	< 10.76	< 9.78
Vanadium	< 0.396	< 0.793	< 0.324	86.05	< 79.04	< 74.89	136.62	< 64.90
Zircon	< 0.025	< 0.033	< 0.046	237.34	285.11	275.05	282.74	156.56
Zinc	0.128	0.043	0.043	< 18.30	34.22	72.56	47.65	19.94
Indium	< 0.004	< 0.006	< 0.003					
Niobium	< 0.026	< 0.012	< 0.040					
Bismuth	< 0.005	< 0.005	< 0.004					
Bromine	< 0.002	< 0.002	0.015					
Gold	< 0.023	< 0.026	< 0.022					
Platinum	< 0.025	< 0.028	< 0.027					

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	H209 - 14"	H50 - 2"	H50 - 9"	H50 - 21"	W43 - 6"	W43 - 14"	W43 - 18"	W43 - 22"
Test Date & Time	8/11/2008 15:08	8/11/2008 15:12	8/11/2008 15:14	8/11/2008 15:16	8/11/2008 15:21	8/11/2008 15:23	8/11/2008 15:25	8/11/2008 15:27
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	61.25	60.91	60.81	60.6	60.86	60.56	61.86	64.43
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 258.12	< 320.98	< 548.44	< 602.82	< 539.57	< 356.85	< 157.52	< 128.15
Arsenic	48.69	< 8.57	8.35	< 8.83	22	11.3	294.38	< 8.22
Barium	< 973.28	< 1091.19	< 1888.29	< 2037.38	2077.65	< 1522.93	< 583.48	< 489.31
Cadmium	< 142.13	< 142.39	< 258.67	< 240.13	< 446.66	< 222.01	< 89.83	< 76.22
Calcium	7064.93	21063.23	20633.21	17748.03	9986.34	13027.99	13926.68	18356.77
Cesium	< 234.39	< 281.94	< 528.66	< 452.95	< 445.81	< 401.03	< 153.64	< 123.02
Chromium	69.92	< 37.32	< 37.17	< 35.52	< 39.02	43.24	78.89	< 37.09
Cobalt	< 138.59	< 211.92	243.03	< 212.68	< 222.75	< 160.91	< 178.07	< 183.92
Copper	2673.61	523.91	569.18	754.7	1358.1	938.25	5971.2	2765.95
Iron	14316.62	29255.96	20887.91	28457.53	32185.31	19031.57	23262.32	21636.3
Lead	948.93	12.61	< 9.25	15.06	22.06	35.65	619.75	11.69
Manganese	201.02	410.13	302.08	441.3	397.77	274.18	276.52	281.28
Mercury	< 11.53	< 10.77	< 9.73	< 11.30	< 10.83	< 9.76	< 11.20	< 11.41
Molybdenum	< 7.13	< 7.63	< 7.31	< 7.96	< 7.96	< 7.06	< 7.16	< 7.94
Nickel	< 56.43	< 67.67	< 59.03	< 69.60	< 67.63	< 57.61	< 59.71	< 62.60
Palladium	< 157.09	< 116.83	< 65.19	< 274.78	< 213.67	< 295.25	< 21.94	< 77.03
Potassium	10932.45	14258.85	19925.1	17788.69	14035.46	8966.68	5864.96	19106.14
Rubidium	35.23	39.84	46.05	42.22	49.50	38.40	23.93	41.82
Scandium	< 30.94	< 47.68	< 46.37	45.16	37.59	68.95	64.72	< 44.62
Selenium	< 6.06	< 4.44	< 4.55	< 5.14	< 5.25	< 4.69	< 5.92	< 5.75
Silver	< 96.18	< 126.83	< 67.67	< 299.14	< 323.10	< 55.68	< 83.71	< 51.58
Strontium	65.34	83.58	73.14	86.06	80.83	65.11	59.26	99.09
Sulfur	< 16466.32	< 17300.29	< 17295.19	< 15699.29	< 15049.11	< 13091.71	21862.46	< 14822.06
Tellurium	< 710.15	< 810.75	< 1474.23	< 1353.81	< 1288.15	< 1165.11	< 427.03	< 360.80
Thorium	< 17.99	< 9.24	12.95	< 9.84	12.69	13.03	< 15.51	10.37
Tin	< 210.64	< 241.24	< 475.34	< 427.11	< 404.79	< 325.01	< 144.50	< 110.23
Titanium	2379.64	3072.24	2763.26	3263.67	2915.22	2113.12	2886.45	2707.36
Tungsten	< 81.96	< 76.77	< 71.43	< 83.01	< 82.58	< 70.77	< 89.33	< 90.56
Uranium	< 10.49	< 10.75	< 10.00	< 12.10	< 11.38	< 10.20	< 9.67	< 11.04
Vanadium	< 131.16	< 88.09	< 84.99	114.45	110.91	< 79.59	107.49	93.1
Zircon	197.27	283.93	280.52	365.04	433.56	298.15	185.86	354.06
Zinc	251.44	36.46	34.18	55.19	85.86	51.39	332.34	48.04
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	W43 - 30"	Core 1 - 2"	Core 1 - 6"	Core 1 - 14"	Core 1 - 24"	Core 2 - 2"	Core 2 - 7"	Core 2 - 14"
Test Date & Time	8/11/2008 15:29	8/11/2008 15:34	8/11/2008 15:37	8/11/2008 15:38	8/11/2008 15:40	8/11/2008 15:43	8/11/2008 15:45	8/11/2008 15:46
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	90.75	60.8	60.9	60.59	60.58	60.55	60.82	90.59
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 26.69	< 219.17	< 227.36	< 509.57	< 296.88	< 251.52	< 419.89	< 21.95
Arsenic	< 9.27	< 7.48	< 13.77	< 13.8	< 11.06	< 8.75	< 8.39	< 9.65
Barium	564.11	< 805.73	< 901.94	< 1810.00	< 1288.73	< 902.17	< 1571.49	378.09
Cadmium	< 14.90	< 102.20	< 133.54	< 368.78	< 152.51	< 181.13	< 274.33	< 12.09
Calcium	21599.08	2721.91	3519.85	7172.26	2923.13	2448.13	1885.33	3814.73
Cesium	63.81	< 208.24	< 227.80	< 439.59	< 324.89	< 243.15	< 390.64	< 20.48
Chromium	< 39.65	55.09	36.55	< 31.92	< 30.51	< 35.92	< 31.29	46.25
Cobalt	< 215.33	< 92.58	< 93.00	< 184.65	< 98.99	< 57.73	< 98.80	< 118.08
Copper	2855.07	198.71	284.76	2743.27	266.55	294.43	105.22	521.6
Iron	28336.03	7710.53	7742.98	19677.83	7174.03	3256.4	8099.31	11323.69
Lead	17.04	18.68	111.71	50.6	49.85	41.91	26.14	36.13
Manganese	393.66	157.76	123.97	274.62	126.61	< 56.36	91.46	141.42
Mercury	< 11.54	< 7.41	< 8.17	< 12.02	< 9.07	< 6.32	< 8.15	< 9.20
Molybdenum	< 7.76	< 6.10	< 6.29	< 8.20	< 6.77	< 5.70	< 6.77	< 6.56
Nickel	< 68.62	< 43.77	< 43.95	< 71.15	< 51.50	< 35.35	< 52.54	< 49.81
Palladium	< 15.12	< 147.89	< 82.17	< 63.19	< 231.61	< 101.56	< 210.84	< 12.00
Potassium	12572.97	6349.25	8664.31	16976.2	10614.08	3889.98	12133.86	10401.33
Rubidium	33.75	32.01	33.46	68.00	37.11	8.39	36.46	36.91
Scandium	< 48.91	< 20.25	< 23.35	< 28.22	< 19.08	< 19.16	< 17.32	< 23.2
Selenium	< 6.15	< 3.81	< 4.00	< 5.49	< 4.88	< 3.12	< 4.04	< 4.00
Silver	< 11.20	< 68.83	< 78.93	< 271.10	< 133.04	< 132.24	< 200.58	< 8.68
Strontium	103.45	26.81	70.69	58.31	37.08	14.05	30.77	45.37
Sulfur	< 18685.59	< 14075.50	< 12371.00	< 14257.72	< 12049.78	< 13320.59	< 13709.29	< 13073.63
Tellurium	77.99	< 595.95	< 662.44	< 1238.53	< 967.51	< 668.27	< 1250.19	< 61.32
Thorium	< 9.72	< 6.73	< 7.90	11.66	< 8.42	< 6.26	< 8.25	< 8.15
Tin	< 22.43	< 164.58	< 214.68	< 421.57	< 290.01	< 177.40	< 349.11	< 18.26
Titanium	3733.02	1941.18	2079.07	2579.83	1625.42	1217.94	1705.09	2059.56
Tungsten	< 90.75	< 55.75	< 57.05	< 95.13	< 68.96	< 42.04	< 57.39	< 67.24
Uranium	< 11.31	< 8.18	< 8.26	< 13.48	< 10.22	< 6.86	< 9.41	< 9.04
Vanadium	124.71	< 67.08	< 68.25	80.35	< 62.33	< 61.59	< 64.21	81.32
Zircon	312.72	152.21	152.21	313.59	136.85	50.25	212.19	169.04
Zinc	41.06	31.88	46.83	36.4	46.23	13.13	20.61	43.07
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Core 2 - 20"	Core 3 - 1"	Core 3 - 6"	Core 3 - 13"	Core 3 - 19"	Core 3 - 25"	Core 4 - 2"	Core 5 - 4"
Test Date & Time	8/11/2008 15:48	8/11/2008 15:51	8/11/2008 15:55	8/11/2008 15:57	8/11/2008 15:58	8/11/2008 16:00	8/11/2008 16:05	8/11/2008 16:09
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	60.48	60.6	181.3	60.5	61.31	60.91	60.54	60.52
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony		< 323.85	< 16.87		< 267.95	< 306.68		< 811.26
Arsenic	< 17.83	< 5.88	< 5.17	< 9.22	< 13.93	< 16.84	< 6.09	< 12.28
Barium		< 1174.54	416.24		< 1066.31	< 1284.76		< 2725.23
Cadmium		< 135.13	< 9.27		< 153.45	< 194.51		< 392.44
Calcium	15382.51	3903.18	2309.03	3370.69	13585.99	5405.45	5193.81	2570.24
Cesium		< 293.41	29.83		< 268.53	< 297.46		< 613.16
Chromium	< 33.97	< 36.88	25.6	47.31	< 34.44	< 35.08	< 38.61	< 32.05
Cobalt	175.58	< 78.93	< 67.89	< 105.13	< 171.47	< 125.46	128.46	< 215.24
Copper	2423.5	395.49	184.57	169.95	1418.09	453.86	210.65	323.99
Iron	19282.08	5897.23	6936.7	8894.82	19642.17	12184.57	8871.19	23556.39
Lead	130.32	11.04	11.04	34.57	85.07	151.92	17.22	26.14
Manganese	218.89	157.99	106.57	148.34	289.32	161.01	142.37	308.4
Mercury	< 11.53	< 6.69	< 6.83	< 8.70	< 10.20	< 8.73	< 6.88	< 13.71
Molybdenum	< 7.75	< 6.01	< 4.81	< 6.62	< 7.43	< 6.60	< 5.80	< 10.31
Nickel	< 60.07	< 39.51	< 39.56	< 49.74	< 61.60	< 55.22	< 40.27	< 85.28
Palladium		< 145.41	< 9.28		< 128.91	< 120.20		< 650.72
Potassium	23625.86	4131.93	9409.75	14329.05	21441.86	14701.49	2650.64	26716.9
Rubidium	58.22	10.50	30.41	40.63	53.69	38.79	5.87	118.03
Scandium	45.92	< 22.35	< 12.37	< 20.69	< 37.92	< 25.61	45.07	< 19.1
Selenium	< 5.33	< 3.34	< 3.21	< 3.88	< 4.95	< 4.61	< 3.38	< 6.53
Silver		< 88.38	< 6.93		< 148.11	< 144.34		< 85.28
Strontium	49.61	28.3	28.48	42.23	69.51	49.86	23.83	49.9
Sulfur	< 16563.37	< 13491.54	< 8613.11	< 12838.64	< 16965.27	< 14314.21	< 10703.83	< 12474.87
Tellurium		< 830.21	< 47.19		< 798.75	< 953.53		< 1817.9
Thorium	21.92	< 6.97	< 5.90	< 8.57	15.16	< 9.81	< 6.00	< 12.79
Tin		< 216.6	< 14.07		< 242.76	< 314.67		< 583.94
Titanium	2568.43	897.73	1229.96	2184.51	3154.07	2559.07	1637.79	2831.62
Tungsten	< 84.32	< 49.97	< 51.94	< 61.08	< 81.7	< 68.00	< 50.13	< 103.70
Uranium	< 12.01	< 7.22	< 6.52	< 8.73	< 11.35	10.81	< 6.02	< 17.48
Vanadium	< 82.35	< 55.89	< 43.32	< 71.18	< 82.00	< 73.04	< 69.79	< 76.78
Zircon	343.18	128.26	105.94	193.97	277.89	136.6	52.35	946.81
Zinc	57.36	< 12.43	< 10.37	17.67	54.63	55.5	41.48	< 23.93
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Core 7 - 1"	Core 7 - 4"	Core 8 - 4"	Core 8 - 14"	Core 8A - 3"	Core 8A - 6"	Core 8A - 10"	Core 8A - 15"
Test Date & Time	8/11/2008 16:15	8/11/2008 16:17	8/11/2008 16:22	8/11/2008 16:26	8/12/2008 8:38	8/12/2008 8:39	8/12/2008 8:40	8/12/2008 8:44
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	60.46	60.98	60.42	180.52	63.46	60.88	60.47	180.79
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 402.49	< 335.20		106.75	< 148.29	< 270.58	< 544.05	28.72
Arsenic	< 6.94	< 8.01	< 6.93	156.86	< 6.69	< 11.00	< 24.48	< 89.86
Barium	< 1226.48	< 1194.67		9030.3	< 532.38	< 1130.22	< 2241.95	5853.27
Cadmium	< 218.22	< 189.93		66.80	< 69.80	< 168.62	< 404.17	37.34
Calcium	6267.78	3080.98	1015.29	19604.43	1328.44	2960.43	2822.96	27529.34
Cesium	< 350.00	< 310.16		95.7	< 135.62	< 278.74	< 569.19	< 18.01
Chromium	< 32.57	66.43	< 30.61	161.53	35.77	< 34.55	< 30.96	112.72
Cobalt	< 79.76	< 116.64	< 69.95	< 167.72	< 77.06	< 108.99	< 105.90	233.27
Copper	178.14	148.22	33.85	18129.74	< 23.84	100.21	550.36	11266.85
Iron	5698.01	10473.61	3926.78	25558.38	4919.74	9536.14	8104.41	17647.25
Lead	14.56	18.57	14.42	11102.03	9.24	57.21	310.83	6954.55
Manganese	90.38	202.88	< 66.91	680.65	113.74	164.4	193.12	416.93
Mercury	< 7.43	< 9.28	< 8.05	< 15.69	< 9.05	< 8.35	< 10.22	< 12.04
Molybdenum	9.25	< 6.79	< 6.18	< 6.56	< 6.46	< 6.61	< 6.75	< 5.80
Nickel	< 42.50	< 50.95	< 46.24	< 68.60	< 49.23	< 48.83	< 51.84	< 54.89
Palladium	< 183.75	< 124.41		< 14.23	< 83.36	< 104.05	< 71.33	< 11.18
Potassium	2931.87	16536.04	12918.4	19977.31	11209.28	24239.97	15806.02	14174.95
Rubidium	13.12	56.13	38.22	48.68	27.58	65.46	54.59	38.72
Scandium	28.21	< 21.04	< 15.03	54.95	< 14.31	< 19.94	< 18.45	< 42.77
Selenium	< 3.71	< 4.46	< 3.95	< 12.73	< 4.29	< 4.08	< 4.88	< 9.49
Silver	< 174.98	< 149.50		84.92	< 69.55	< 112.88	< 272.55	42.98
Strontium	24.33	54.71	29	300.67	21.46	50.31	47.01	189.22
Sulfur	< 13003.70	< 14994.26	< 10316.67	51925.41	< 11410.11	< 15131.15	< 12549.47	38004.75
Tellurium	< 923.36	< 968.74		< 43.35	< 414.61	< 827.42	< 1889.69	< 53.27
Thorium	< 6.52	< 8.63	< 7.39	87.16	< 7.74	< 9.21	< 12.03	55.31
Tin	< 288.47	< 308.34		3003.42	< 127.23	< 268.14	< 548.59	1960.65
Titanium	1339.93	1894.43	947.72	3499.69	1113.79	2138.23	2492.98	3101.04
Tungsten	< 50.56	< 66.13	< 58.42	149.8	< 62.51	< 61.24	< 71.60	< 89.89
Uranium	< 7.28	< 11.12	< 9.11	< 12.33	< 8.03	< 10.78	< 11.30	< 9.42
Vanadium	< 59.96	< 67.25	< 52.34	< 234.68	< 57.16	< 76.09	< 75.98	< 169.36
Zircon	69.78	154.35	110.3	236.69	92.93	238.21	219.71	212.01
Zinc	20.01	22.43	< 11.90	1247.85	< 12.58	24.17	47.95	720.32
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Core 8A - 20"	Core 8A - 28"	W16 - 2"	W16 - 6"	W16 - 11"	W16 - 16"	W16 - 20"	W16 - 23"
Test Date & Time	8/12/2008 8:45	8/12/2008 8:47	8/12/2008 8:53	8/12/2008 8:56	8/12/2008 9:00	8/12/2008 9:02	8/12/2008 9:04	8/12/2008 9:05
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	60.62	60.42	62.55	180.85	212.25	60.45	60.47	60.18
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 391.00		< 196.68	< 17.19		83.42		
Arsenic	< 13.63	16.81	< 7.65	< 39.96	103.83	< 9.53	< 10.25	< 8.28
Barium	< 1482.57		991.14	2951.23	6734.4			
Cadmium	< 325.88		< 124.36	11.62	49.80			
Calcium	5466.64	5526.12	2159.02	5510.82	16978.93	2038.37	7535.87	2896.34
Cesium	< 401.91		< 176.9	16.18	102.99			
Chromium	< 37.30	< 36.54	< 29.73	40.9	142.29	< 28.32	< 35.71	< 30.42
Cobalt	< 79.79	< 120.87	< 84.80	< 62.11	< 116.06	< 100.63	< 177.58	< 102.53
Copper	223.27	464.82	41.87	1940.02	11660.75	232.31	2069.32	233.91
Iron	5788.34	12965.62	5407.81	12372.37	21155.18	7279.94	21531.87	8556.91
Lead	119	132.38	17	1917.48	7873.66	28.77	30.46	17.9
Manganese	82.2	207.2	78.7	203.92	556.2	132.5	278.64	119.12
Mercury	< 7.26	< 8.48	< 9.08	< 7.56	< 10.46	< 9.77	< 10.66	< 9.48
Molybdenum	< 6.07	< 6.49	< 6.37	< 5.07	< 4.86	< 6.77	< 7.51	< 6.63
Nickel	< 41.69	< 46.38	< 48.93	< 39.71		69.53	< 52.11	< 62.82
Palladium	< 202.32		< 111.42	< 9.58	17.81			
Potassium	6420.01	10446.33	9302.43	20841.22	19730.61	9493.7	19267.38	10754.92
Rubidium	22.71	33.79	33.84	51.13	52.52	37.23	48.51	36.27
Scandium	< 25.4	< 27.19	< 16.55	< 21.25	55.42	< 16.21	< 30.42	< 18.32
Selenium	< 3.63	< 4.29	< 4.28	< 5.06	< 8.57	< 4.84	< 5.18	< 4.67
Silver	< 192.61		< 64.29	16.82	63.57			
Strontium	37.75	39.91	30.03	89.15	209.36	27.44	45.04	34.02
Sulfur	17644.41	< 15715.55	< 11737.22	< 13641.08	52788.77	< 10446.04	< 15135.20	< 11444.15
Tellurium	< 1197.37		< 574.87	< 47.10	131.27			
Thorium	< 8.62	10.64	< 8.38	28.37	57.91	< 8.44	16.04	< 8.40
Tin	< 370.81		< 165.67	836.34	2067.91			
Titanium	1290.49	2568.49	967.77	3203.66	3966.26	1093.1	3310.81	1408.26
Tungsten	< 50.65	< 59.94	< 63.01	< 52.30	< 77.24	< 68.90	< 83.27	< 66.26
Uranium	< 8.03	< 8.31	< 8.87	< 8.01	< 8.86	< 9.57	< 11.56	< 9.82
Vanadium	92.21	< 85.24	< 53.06	107.68	< 193.65	< 55.17	< 83.97	< 60.30
Zircon	135.24	234.61	140.35	244.71	194.22	141.66	245.92	158.23
Zinc	64.01	50.61	17.52	178.98	861.71	< 16.16	32.25	25.96
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	W16 - 27"	W16 - 30"	H2 - 4"	H2 - 12"	H2 - 18"	H2 - 22"	H2 - 32"	Core 10 - 2"
Test Date & Time	8/12/2008 9:06	8/12/2008 9:08	8/12/2008 9:13	8/12/2008 9:14	8/12/2008 9:16	8/12/2008 9:17	8/12/2008 9:19	8/12/2008 9:24
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	60.27	60.69	60.41	60.47	60.88	60.46	60.79	61.54
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony		< 319.47		< 432.18	< 345.83		< 443.17	< 224.53
Arsenic	< 13.45	< 15.05	< 9.24	< 8.27	< 7.90	< 9.04	< 9.66	< 9.39
Barium		< 1113.87		< 1765.48	< 1260.19		< 1519.65	< 872.20
Cadmium		< 144.13		< 278.85	< 164.62		< 233.79	< 157.42
Calcium	3732.83	3351.96	13836.82	29028.64	29303.08	21811.43	17709.07	35165.61
Cesium		< 289.09		< 433.83	< 325.76		< 395.09	< 224.55
Chromium	55.13	< 35.62	< 34.86	< 37.77	< 39.95	< 36.90	< 36.22	< 40.59
Cobalt	< 115.40	< 114.74	< 204.62	< 177.03	< 187.86	< 187.60	< 198.10	< 251.15
Copper	338.94	366.62	880.09	653.73	675.27	622.22	673.93	1914.83
Iron	10761.39	11485	26825.24	22167.75	24818.93	24752.35	25972.86	38655.23
Lead	92.93	135.21	16.43	< 10.33	< 10.39	18.09	19	22.64
Manganese	160.34	182.62	330.48	459.73	339.22	344.72	284.7	571.8
Mercury	< 8.35	< 7.97	< 11.30	< 10.31	< 10.40	< 10.09	< 10.65	< 11.51
Molybdenum	< 6.67	< 6.55	< 8.07	< 7.65	< 7.31	< 7.52	< 7.93	< 7.77
Nickel	< 50.93	< 45.77	< 67.73	< 63.06	< 60.59	78.61	< 60.80	< 71.28
Palladium		< 133.41		< 376.51	< 187.61		< 55.98	< 114.19
Potassium	10515.43	8407.82	19199.58	17458.7	14554.8	14004.77	18285.42	10269.42
Rubidium	39.84	31.69	50.96	40.32	32.80	36.99	52.47	29.57
Scandium	< 22.25	< 22.8	< 38.55	< 55.45	73.93	< 48.27	< 43.75	94.91
Selenium	< 3.93	< 4.30	< 5.67	< 5.11	< 5.19	< 5.25	< 4.49	< 5.16
Silver		< 127.38		< 212.48	< 130.05		< 177.05	< 97.01
Strontium	36.61	38.67	116.65	92.41	97.97	99.72	111.99	109.3
Sulfur	< 11223.56	< 13250.42	< 14293.16	< 17888.16	< 19951.43	< 16252.43	< 16000.12	< 20187.98
Tellurium		< 751.55		< 1364.86	< 1038.20		< 1178.26	< 672.81
Thorium	< 9.00	< 9.10	15.68	< 8.78	< 9.23	10.99	17.16	12.55
Tin		< 256.12		< 365.21	< 314.75		< 355.8	< 195.68
Titanium	2039.85	2237.04	2683.96	3284.88	3567.88	3174.85	3059.56	4391.92
Tungsten	< 60.91	< 57.36	< 86.52	< 76.36	< 76.46	< 76.19	< 76.18	< 84.87
Uranium	< 9.65	13.61	< 12.57	< 10.64	< 10.25	< 10.75	< 11.86	< 11.21
Vanadium	< 73.43	< 76.07	< 85.24		112.78	122.89	102.29	< 84.97
Zircon	271.69	242.22	477.55	286.28	283.47	327.25	450.91	295.36
Zinc	33.89	41.95	40.39	44.6	62.94	65.96	48.51	< 26.83
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Core 10 - 8"	Core 10 - 18"	Core 11 - 10"	Core 11 - 28"	W16	W16	Lake Linden Beach - Dar	Lake Linden S. of Dock
Test Date & Time	8/12/2008 9:25	8/12/2008 9:26	8/12/2008 9:31	8/12/2008 9:32	8/12/2008 9:57	8/12/2008 9:59	8/12/2008 10:04	8/12/2008 10:06
Sampling Mode	Core/In-situ	Core/In-situ	Core/In-situ	Core/In-situ	Bag	Bag	Bag	Bag
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	60.48	60.8	60.93	63.68	93.02	91.27	91.27	92.9
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 732.30	< 404.09	< 346.04	< 141.14	< 22.70	< 22.35	< 24.30	< 22.48
Arsenic	11.3	< 9.02	< 7.28	< 8.18	64.44	< 26.57	< 8.04	< 7.92
Barium	< 2104.45	< 1550.76	< 1148.6	< 529.83	478.36	576.72	274.93	256.3
Cadmium	< 410.88	< 348.22	< 183.84	< 74.89	< 12.62	< 12.66	< 13.17	< 12.25
Calcium	25366.05	25168.5	11970.65	17575.63	3689.44	4334.41	19594.99	8479.76
Cesium	< 568.53	< 403.66	< 295.70	< 132.96	26.99	< 20.68	< 22.88	< 21.11
Chromium	< 41.24	< 42.20	< 35.27	< 37.35	< 40.73	60.32	47.13	94.91
Cobalt	< 195.81	< 228.23	< 150.11	< 194.63	< 114.65	< 117.65	< 217.25	< 177.98
Copper	2351.84	2628.91	1135.11	1636.28	832.49	669.75	2328.82	943.48
Iron	26458.36	33842.84	16052.7	25051.18	11635.14	11293.01	32217.22	24100.71
Lead	12.76	16.64	< 10.12	< 10.71	376.96	428.06	< 10.60	< 9.89
Manganese	328.2	425.99	274.27	218.18	159.55	183.86	478.59	298.76
Mercury	< 11.02	< 11.67	< 9.81	< 10.30	< 9.24	< 8.30	< 10.42	< 9.97
Molybdenum	< 7.59	< 7.67	< 7.63	< 7.79	< 6.28	< 6.56	< 7.39	< 7.24
Nickel	< 63.03	< 69.19	< 56.84	< 63.45	< 46.19	< 49.81	< 67.82	< 57.77
Palladium	< 494.25	< 58.78	< 165.28	< 73.78	< 12.47	< 12.57	< 13.26	< 12.24
Potassium	20995.13	16628.46	17706.46	18935.78	15317.5	10278.1	12572.74	5687.76
Rubidium	37.37	35.40	44.92	42.73	49.06	38.47	30.23	38.88
Scandium	64.66	< 54.82	< 36.40	54.67	< 23.20	< 24.37	61.93	45.62
Selenium	< 5.49	< 5.21	< 4.86	< 4.81	< 4.56	< 4.61	< 5.54	< 5.19
Silver	< 335.23	< 195.09	< 74.75	< 52.81	< 9.36	< 9.33	< 10.16	< 8.93
Strontium	77.98	97.29	126.64	129.09	28.68	42.63	79.98	87.76
Sulfur	< 18150.82	< 18705.14	< 14062.65	< 14827.31	< 15296.53	< 12570.99	< 20281.30	< 15671.82
Tellurium	< 1575.05	< 1241.63	< 945.52	< 397.97	< 63.06	< 61.85	< 68.12	< 62.64
Thorium	9.71	13.73	17.44	< 9.57	< 11.38	< 13.07	10.34	10.56
Tin	< 512.89	< 430.44	< 256.11	< 114.79	34.42	69.37	< 20.33	< 18.63
Titanium	3883.07	4739.26	2027.32	3073.14	2645.46	2739.36	4230.31	2245.78
Tungsten	< 83.14	< 87.65	< 70.42	< 77.04	< 64.24	< 61.94	< 77.86	< 67.71
Uranium	< 10.16	< 11.44	< 11.20	< 11.57	< 9.77	< 9.54	< 10.56	< 10.18
Vanadium	108.81	115.15	< 76.42	< 90.72	122.7	113.21	144.07	107.9
Zircon	289.29	361.53	390.48	454.54	153.27	245.34	266.65	356.28
Zinc	66.98	36.05	38.87	24.9	81.51	67.98	52.6	38.31
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Lake Linden SE Sludge	Lake Linden SE Sludge	Lake Linden SE Sludge	W16	Lake Linden Beach - Dark	Lake Linden S. of Dock	Lake Linden SE Sludge
Test Date & Time	8/12/2008 10:09	8/12/2008 10:12	8/12/2008 10:14	8/28/2008 13:23	8/28/2008 13:29	8/28/2008 13:36	8/28/2008 13:49
Sampling Mode	Bag	Bag	Bag	Cup	Cup	Cup	Cup
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	91.19	105.1	91.11	362.79	362.79	362.09	362.79
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 13.68	<13.06	< 9.73	< 12.11	< 13.74	26.81	< 9.11
Arsenic	< 5.24	< 5.15	< 5.20	< 17.36	10.14	8.05	< 3.28
Barium	< 47.92	< 46.60	< 35.96	1017.43	529.15	822.83	< 32.22
Cadmium	< 7.74	< 7.39	< 5.30	< 6.81	< 7.64	< 7.58	< 5.12
Calcium	21558.39	10343.27	25754.67	7389.5	51162.18	40606.91	50899.8
Cesium	< 12.99	< 12.75	< 9.92	36.32	40.19	80.05	< 8.50
Chromium	< 39.08	< 44.10	< 45.03	< 22.48	37.71	< 25.14	< 26.67
Cobalt	< 78.87	< 82.20	< 48.75	< 74.65	< 144.94	< 127.55	< 80.35
Copper	125.61	61.08	57.29	1146.55	3249.45	1583.43	311.62
Iron	7596.41	11458.95	2579.77	17626.39	50851.02	42560.86	26275.58
Lead	10.24	16.46	10.59	670.59	12.23	14.21	11.54
Manganese	103.54	106.92	< 46.64	288.32	789.75	522.52	411.92
Mercury	< 6.50	< 6.11	< 7.07	< 5.19	< 6.63	< 5.69	< 4.02
Molybdenum	7.33	17.41	21.87	< 3.50	< 4.16	< 4.14	< 2.93
Nickel	337.39	878.31	1365.02	< 29.10	54.06	70.58	459.07
Palladium	< 7.56	< 7.51	< 5.12	< 6.67	< 7.55	< 7.67	< 4.92
Potassium	3847.85	2178.25	2860.7	40405.5	32049.8	36760.52	14748.44
Rubidium	< 2.66	< 2.38	< 2.56	66.68	42.32	53.59	12.57
Scandium	94.73	76.63	< 52.82	16.56	27.91	36.28	27.59
Selenium	< 3.04	< 3.02	< 3.16	< 2.82	< 2.87	< 2.68	< 1.90
Silver	< 5.69	< 5.49	< 3.91	< 5.08	< 5.76	5.98	< 3.77
Strontium	17.67	8.84	6.49	54.14	128.91	131.75	52.42
Sulfur	< 13028.43	< 17325.97	< 17017.52	17604.71	< 13484.63	< 12982.01	< 12713.93
Tellurium	< 38.01	< 36.89	< 27.72	44.62	< 38.20	86.64	< 25.36
Thorium	< 5.56	< 5.03	< 5.61	19.47	12.67	14.87	< 3.39
Tin	< 11.06	< 10.66	< 7.81	174.31	14.39	33.50	< 7.46
Titanium	2294.39	518.2	994.64	4674.77	7386.98	6408.38	7000.27
Tungsten	< 53.26	< 53.92	< 65.73	< 37.56	< 50.12	< 42.28	< 32.21
Uranium	< 5.83	8.17	6.93	12.64	7.86	7.43	< 3.39
Vanadium	91.98	< 60.15	< 62.65	< 67.09	164.7	147.94	153.11
Zircon	29.18	20.43	29.44	261.03	381.2	530.42	103.99
Zinc	< 10.92	19.21	36.61	98.59	74.34	61.11	43.67
Indium							
Niobium							
Bismuth							
Bromine							
Gold							
Platinum							

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	Core 1 - 0.45-0.58'	Core 2 - 1.06-1.32'	Core 8 - 1.05-1.35'	Core 8A - 1.35-1.51'	Core 10 - 0.00-0.44'	Core 11 - 1.00-1.25'	W16 - 0.73-1.05'	W16 - 2.15-2.83'
Test Date & Time	8/28/2008 13:55	8/28/2008 14:01	8/28/2008 14:08	8/28/2008 14:14	8/28/2008 14:21	8/28/2008 14:27	8/28/2008 15:25	8/28/2008 15:31
Sampling Mode	Cup	Cup	Cup	Cup	Cup	Cup	Cup	Cup
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	365.2	363.72	363.35	363.06	366.35	362.6	362.46	362.05
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	< 10.82	< 12.01	170.11	171.2	14.69	< 12.82	122.71	< 12.11
Arsenic	5.44	< 7.68	398.77	567.51	11.53	< 4.45	207.9	13.95
Barium	218.12	718.88	12692.58	13870.17	562.04	674.26	9658.68	435.8
Cadmium	< 6.06	< 6.68	74.12	90.67	< 7.97	< 7.06	61.27	< 6.77
Calcium	7597.2	7791.68	34278.91	32485.81	57627.13	44614.61	25796.53	13086.53
Cesium	< 10.00	39.89	103.69	136.72	66.07	48.83	99.61	< 11.23
Chromium	< 18.47	< 20.26	119.86	122.86	< 25.43	< 24.61	86.79	< 23.30
Cobalt	< 54.98	< 68.94	< 159.54	< 160.50	< 162.04	< 113.94	< 133.18	< 97.87
Copper	274.3	498.05	25974.01	28980.35	2533.4	1729.8	17025.17	819.47
Iron	11354.98	15272.33	39828.91	39172.32	63267.04	35041.11	33110.25	28475.2
Lead	46.77	114.04	15383.63	16288.95	9.5	12.34	10351.93	238.2
Manganese	159.14	240.79	1030.71	1227.91	935.68	446.02	845.82	401.4
Mercury	< 4.39	< 4.99	< 13.97	< 14.83	< 6.68	< 5.91	< 11.09	< 5.38
Molybdenum	< 3.12	< 3.51	< 5.14	< 5.41	< 4.07	< 4.10	< 4.79	< 3.78
Nickel	< 24.09	< 28.1	98.14	118.58	97.33	37.19	69.88	< 30.83
Palladium	< 5.98	< 6.62	15.6	< 12.20	< 8.13	< 7.03	12.94	< 6.60
Potassium	25627.81	28446.19	34612.47	32254.11	19904.06	38228.59	34603.25	36838.99
Rubidium	43.29	48.01	71.90	63.21	27.77	57.82	68.44	64.62
Scandium	15.32	15.98	23.68	23.68	43.3	36.79	20.69	21.14
Selenium	< 2.15	< 2.51	< 11.96	< 12.37	< 3.04	< 2.89	< 9.20	< 2.78
Silver	< 4.38	< 4.96	118.89	130.63	< 6.05	< 5.21	85.06	< 5.05
Strontium	64.81	53.38	421.53	392.67	124.99	178.86	307.8	73.2
Sulfur	< 8587.01	12922.77	186842.3	186419.67	< 12440.84	< 12165.63	141471.36	30477.29
Tellurium	< 30.05	38.7	165.36	246.4	92.89	< 35.93	179.71	< 33.64
Thorium	4.09	7.41	214.15	228.1	10.62	18.17	145.55	11.72
Tin	< 9.00	25.06	4100.26	4294.96	23.95	12.64	2826.99	46.42
Titanium	2747.49	5703.26	5835.37	5847.26	7384.97	6208.4	5145.06	6397.91
Tungsten	< 31.02	< 36.22	161.13	236.91	< 50.21	< 43.85	93.63	< 38.23
Uranium	< 4.70	8.12	11.17	16.74	8.13	9.09	9.39	13.56
Vanadium	44.64	< 57.73	< 175.94	< 188.62	140.32	170.15	< 158.47	120.51
Zircon	152.18	326.24	279.07	295.1	294.68	565.94	331.53	403.19
Zinc	39.55	43.55	1743.3	1940.4	53.89	50.06	1204.23	89.63
Indium								
Niobium								
Bismuth								
Bromine								
Gold								
Platinum								

Lake Linden
XRF Sample Results

Torch Lake XRF Data
Samples collected: 8/4-8/2008

Sample	H2 - 0.00-0.12'	H43 - 1.40-1.67'	H50 - 0.64'-0.97'	H209 - 1.00'-1.25'	H225 - 1.0'-1.2'	Lake Linden SE Sludge
Test Date & Time	8/28/2008 15:37	8/28/2008 15:44	8/28/2008 15:50	8/28/2008 15:57	8/28/2008 16:06	8/28/2008 16:12
Sampling Mode	Cup	Cup	Cup	Cup	Cup	Cup
Test Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Test Duration (sec.)	363.39	363.55	364.51	365.46	367.87	365.27
Units	ppm	ppm	ppm	ppm	ppm	ppm
Antimony	13.57	< 13.88	< 13.55	29.23	< 12.95	< 4.64
Arsenic	< 5.16	176.08	< 4.78	131.51	6.03	< 2.50
Barium	784.23	568.52	748.21	1386.42	658.27	< 17.15
Cadmium	< 7.47	< 7.78	< 7.47	7.90	< 7.14	< 2.51
Calcium	57495.29	36874	49088.65	19764.5	50554.59	21743.22
Cesium	64.66	26.65	73.96	56.41	45.47	< 4.73
Chromium	< 25.49	45.82	31.26	34.18	< 23.41	199.29
Cobalt	< 126.28	< 153.00	< 133.65	< 105.20	< 104.53	< 20.6
Copper	1180.61	8936.99	755.62	4431.51	701.26	26.26
Iron	42304.94	56601.44	47634.97	30424.87	31535	2040.33
Lead	24.56	995.69	19.19	1933.07	46.21	10.63
Manganese	543.84	687.67	615.62	424.82	476.36	< 22.79
Mercury	< 6.03	< 7.30	< 5.89	< 6.53	< 5.55	< 3.69
Molybdenum	< 4.06	< 4.16	< 4.00	< 3.87	< 3.82	21.56
Nickel	58.74	88.82	65.11	52.96	50.31	1500.07
Palladium	< 7.54	< 7.75	< 7.53	10.71	< 7.09	< 2.45
Potassium	34722.23	21981.76	36125.04	31364.43	43115.73	3856.8
Rubidium	50.85	42.49	51.24	57.89	57.15	< 1.22
Scandium	42.93	23.66	39.7	25.52	38.79	27.13
Selenium	< 2.71	< 3.83	< 2.72	< 4.04	< 2.57	< 1.55
Silver	< 5.61	16.75	< 5.65	15.06	6.06	< 1.83
Strontium	129.39	119.51	114.08	95.09	119.58	6.21
Sulfur	16957.14	94224.38	< 13288.04	89999.31	11914.19	6247.3
Tellurium	70.79	< 38.30	80.69	74.82	< 35.96	< 13.28
Thorium	16.01	41.51	15.6	41.09	17.04	< 2.72
Tin	28.03	249.56	29.73	349.76	18.53	< 3.71
Titanium	7119.61	7100.94	6964.68	6487.66	5220.63	942.22
Tungsten	< 43.76	< 58.29	< 43.00	< 49.65	< 39.57	< 33.86
Uranium	8.40	11.07	8.40	9.75	7.95	5.45
Vanadium	181.25	130.63	177.41	93.75	109.04	53.57
Zircon	498.94	385.43	440.36	313.98	420.3	21.82
Zinc	69.69	350.51	55.9	390.12	79.21	37.22
Indium						
Niobium						
Bismuth						
Bromine						
Gold						
Platinum						



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Division: WB
Report to: SHARON BAKER
 MDEQ-RRD-LANSING
 CONSTITUTION HALL
 525 W. ALLEGAN, LANSING, MI 48909

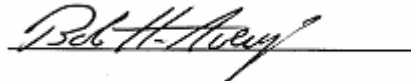
Lab Work Order #: 81000137
Work Site ID: 31000003
Site Name: TORCH LAKE
Received: 10/16/2008
Reported: 11/10/2008
Collected By: SHARON BAKER

Total: \$1,526.00

Samples Received :

No:	Sample ID	Sample Description	Matrix:	Collection Date
01	AB25587	3RD BAY WATER	WATER	10/14/2008
02	AB25588	CENTRAL PIT WATER	WATER	10/14/2008
03	AB25589	CENTRAL PIT #2 (DECANTED)	WATER	10/14/2008
04	AB25590	3RD BAY SEDS WATER	WATER	10/14/2008

I certify that the analysis performed by the MDEQ Environmental Laboratory are accurate and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.


 Bob Avery, Laboratory Director



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 Lansing, MI 48909
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Sample Number: AB25587 3RD BAY WATER

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 10/21/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	99.3			
SURROGATE	#Dibromofluoromethane#	93.8			
SURROGATE	#Toluene-d8#	96.5			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0	5	1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0	5	1.0
74-83-9	Bromomethane	Not Detected	5.0		1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
 Inorganic Unit Mgr: Sandy Gregg
 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



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Lansing, MI 48909
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Sample Number: AB25587 3RD BAY WATER

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 10/21/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmeylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

PCBs as Aroclors

Analytical Method: 8082 **Date Tested:** 10/25/2008 **Analyst:** MF
Extraction Method: 3510 **Extraction Date:** 10/20/2008 **Qualifier:** **Volume:** 1000

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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 Systems Mgmt Unit: George Krisztian



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Sample Number: AB25587 3RD BAY WATER

PCBs as Aroclors

CAS #	Compound	Result ug/L	RL	Qualifier	Volume: 1000 Dilution Factor
SURROGATE	#Decachlorobiphenyl#	50.6			
SURROGATE	#Tetrachloro-m-xylene#	42.5			
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0

Base Neutral Acids with Library Search

CAS #	Compound	Result ug/L	RL	Qualifier	Volume: 1000 Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	40.7			
SURROGATE	#2,4,6-Tribromophenol#	90.0			
SURROGATE	#2-Fluorophenol#	20.0			
SURROGATE	#Nitrobenzene - D5#	40.1			
SURROGATE	#Phenol - D6#	14.0			
SURROGATE	#p-Terphenyl-D14#	85.4			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.0		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.0		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.0		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	25		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.0		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.0		1.0
95-51-2	2-Chloroaniline	Not Detected	5.0		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.0		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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Sample Number: AB25587 3RD BAY WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 10/20/2008
 Extraction Date: 10/17/2008

Analyst: SMH
 Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.0		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	25		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.0		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	50		1.0
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0	5	1.0
117-81-7	Bis(2-ethylhexyl)phthalate	Not Detected	5.0		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.0		1.0
86-74-8	Carbazole	Not Detected	5.0		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.0		1.0
84-66-2	Diethylphthalate	Not Detected	5.0		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.0		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.0		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.0		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.0		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
 Inorganic Unit Mgr: Sandy Gregg
 Organic Unit Mgr: Carol Smith
 Systems Mgmt Unit: George Krisztian



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
 ENVIRONMENTAL LABORATORY

P.O. Box 30270
 Lansing, MI 48909
 TEL: (517) 335-9800
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Sample Number: AB25587 3RD BAY WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0		1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.0		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.0		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0		1.0

A library search found no reportable compounds.
 Probable petroleum product(s) present.

Florisol Cleanup	Completed	10/24/2008	3620	DT
Gel Permeation Cleanup	Completed	10/22/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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 Lansing, MI 48909
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 FAX: (517) 335-9600

Sample Number: AB25588 CENTRAL PIT WATER

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 10/21/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Bromofluorobenzene#	98.1			
SURROGATE	#Dibromofluoromethane#	93.3			
SURROGATE	#Toluene-d8#	95.8			
630-20-6	1,1,1,2-Tetrachloroethane	Not Detected	1.0		1.0
71-55-6	1,1,1-Trichloroethane	Not Detected	1.0		1.0
79-34-5	1,1,2,2-Tetrachloroethane	Not Detected	1.0		1.0
79-00-5	1,1,2-Trichloroethane	Not Detected	1.0		1.0
75-34-3	1,1-Dichloroethane	Not Detected	1.0		1.0
75-35-4	1,1-Dichloroethylene	Not Detected	1.0		1.0
87-61-6	1,2,3-Trichlorobenzene	Not Detected	5.0		1.0
96-18-4	1,2,3-Trichloropropane	Not Detected	1.0		1.0
526-73-8	1,2,3-Trimethylbenzene	Not Detected	1.0		1.0
120-82-1	1,2,4-Trichlorobenzene	Not Detected	5.0		1.0
95-63-6	1,2,4-Trimethylbenzene	Not Detected	1.0		1.0
96-12-8	1,2-Dibromo-3-chloropropane	Not Detected	5.0	5	1.0
106-93-4	1,2-Dibromoethane	Not Detected	1.0		1.0
95-50-1	1,2-Dichlorobenzene	Not Detected	1.0		1.0
107-06-2	1,2-Dichloroethane	Not Detected	1.0		1.0
78-87-5	1,2-Dichloropropane	Not Detected	1.0		1.0
108-67-8	1,3,5-Trimethylbenzene	Not Detected	1.0		1.0
541-73-1	1,3-Dichlorobenzene	Not Detected	1.0		1.0
106-46-7	1,4-Dichlorobenzene	Not Detected	1.0		1.0
78-93-3	2-Butanone (MEK)	Not Detected	5.0		1.0
591-78-6	2-Hexanone	Not Detected	5.0		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0	X	1.0
67-64-1	2-Propanone (acetone)	Not Detected	20		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Detected	5.0		1.0
107-13-1	Acrylonitrile	Not Detected	5.0	Z	1.0
71-43-2	Benzene	Not Detected	1.0		1.0
108-86-1	Bromobenzene	Not Detected	1.0		1.0
74-97-5	Bromochloromethane	Not Detected	1.0		1.0
75-27-4	Bromodichloromethane	Not Detected	1.0		1.0
75-25-2	Bromoform	Not Detected	1.0	5	1.0
74-83-9	Bromomethane	Not Detected	5.0		1.0
75-15-0	Carbon disulfide	Not Detected	1.0		1.0
56-23-5	Carbon tetrachloride	Not Detected	1.0		1.0
108-90-7	Chlorobenzene	Not Detected	1.0		1.0
75-00-3	Chloroethane	Not Detected	5.0		1.0
67-66-3	Chloroform	Not Detected	1.0		1.0
74-87-3	Chloromethane	Not Detected	5.0		1.0
156-59-2	cis-1,2-Dichloroethylene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
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FAX: (517) 335-9600

Sample Number: AB25588 **CENTRAL PIT WATER**

Volatile Compounds with Library Search

Analytical Method: 8260 **Date Tested:** 10/21/2008 **Analyst:** KCL

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
10061-01-5	cis-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-82-7	Cyclohexane	Not Detected	5.0		1.0
124-48-1	Dibromochloromethane	Not Detected	1.0		1.0
74-95-3	Dibromomethane	Not Detected	1.0		1.0
75-71-8	Dichlorodifluoromethane	Not Detected	5.0		1.0
60-29-7	Diethyl ether	Not Detected	5.0		1.0
108-20-3	Diisopropyl Ether	Not Detected	5.0		1.0
100-41-4	Ethylbenzene	Not Detected	1.0		1.0
637-92-3	Ethyltertiarybutylether	Not Detected	5.0		1.0
67-72-1	Hexachloroethane	Not Detected	5.0		1.0
98-82-8	Isopropylbenzene	Not Detected	1.0		1.0
108383,106423	m & p - Xylene	Not Detected	2.0		1.0
74-88-4	Methyl iodide	Not Detected	1.0		1.0
75-09-2	Methylene chloride	Not Detected	5.0		1.0
1634-04-4	Methyltertiarybutylether	Not Detected	1.0		1.0
91-20-3	Naphthalene	Not Detected	5.0	X	1.0
104-51-8	n-Butylbenzene	Not Detected	1.0		1.0
103-65-1	n-Propylbenzene	Not Detected	1.0		1.0
95-47-6	o-Xylene	Not Detected	1.0		1.0
99-87-6	p-Isopropyl toluene	Not Detected	1.0		1.0
135-98-8	sec-Butylbenzene	Not Detected	1.0		1.0
100-42-5	Styrene	Not Detected	1.0		1.0
98-06-6	tert-Butylbenzene	Not Detected	1.0		1.0
75-65-0	tertiary Butyl Alcohol	Not Detected	50		1.0
994-05-8	tertiaryAmylmehtylether	Not Detected	5.0		1.0
127-18-4	Tetrachloroethylene	Not Detected	1.0		1.0
109-99-9	Tetrahydrofuran	Not Detected	5.0		1.0
108-88-3	Toluene	Not Detected	1.0		1.0
156-60-5	trans-1,2-Dichloroethylene	Not Detected	1.0		1.0
10061-02-6	trans-1,3-Dichloropropylene	Not Detected	1.0		1.0
110-57-6	trans-1,4-Dichloro-2-butene	Not Detected	5.0	Z	1.0
79-01-6	Trichloroethylene	Not Detected	1.0		1.0
75-69-4	Trichlorofluoromethane	Not Detected	1.0		1.0
75-01-4	Vinyl chloride	Not Detected	1.0		1.0

A library search found no reportable compounds.

PCBs as Aroclors

Analytical Method: 8082 **Date Tested:** 10/25/2008 **Analyst:** MF
Extraction Method: 3510 **Extraction Date:** 10/20/2008 **Qualifier:** **Volume:** 1000

CAS # **Compound** **Result ug/L** **RL** **Qualifier** **Dilution Factor**

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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ENVIRONMENTAL LABORATORY

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Lansing, MI 48909
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FAX: (517) 335-9600

Sample Number: AB25588 CENTRAL PIT WATER

PCBs as Aroclors

Analytical Method: 8082	Date Tested: 10/25/2008	Analyst: MF	
Extraction Method: 3510	Extraction Date: 10/20/2008	Qualifier:	Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	56.0			
SURROGATE	#Tetrachloro-m-xylene#	50.8			
12674-11-2	Aroclor 1016	Not Detected	0.10		1.0
11104-28-2	Aroclor 1221	Not Detected	0.10		1.0
11141-16-5	Aroclor 1232	Not Detected	0.10		1.0
53469-21-9	Aroclor 1242	Not Detected	0.10		1.0
12672-29-6	Aroclor 1248	Not Detected	0.10		1.0
11097-69-1	Aroclor 1254	Not Detected	0.10		1.0
11096-82-5	Aroclor 1260	Not Detected	0.10		1.0
37324-23-5	Aroclor 1262	Not Detected	0.10		1.0
11100-14-4	Aroclor 1268	Not Detected	0.10		1.0

Base Neutral Acids with Library Search

Analytical Method: 8270	Date Tested: 10/20/2008	Analyst: SMH	
Extraction Method: 3510	Extraction Date: 10/17/2008	Qualifier:	Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	75.8			
SURROGATE	#2,4,6-Tribromophenol#	99.5			
SURROGATE	#2-Fluorophenol#	35.7			
SURROGATE	#Nitrobenzene - D5#	82.6			
SURROGATE	#Phenol - D6#	24.4			
SURROGATE	#p-Terphenyl-D14#	80.7			
120-82-1	1,2,4-Trichlorobenzene	Not Detected	2.0		1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	5.0		1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	4.0		1.0
120-83-2	2,4-Dichlorophenol	Not Detected	10		1.0
105-67-9	2,4-Dimethylphenol	Not Detected	5.0		1.0
51-28-5	2,4-Dinitrophenol	Not Detected	25		1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	5.0		1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	5.0		1.0
95-51-2	2-Chloroaniline	Not Detected	5.0		1.0
91-58-7	2-Chloronaphthalene	Not Detected	2.0		1.0
95-57-8	2-Chlorophenol	Not Detected	10		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	20		1.0
91-57-6	2-Methylnaphthalene	Not Detected	5.0		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	10		1.0
88-74-4	2-Nitroaniline	Not Detected	20		1.0
88-75-5	2-Nitrophenol	Not Detected	5.0		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	20		1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
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 ENVIRONMENTAL LABORATORY

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 Lansing, MI 48909
 TEL: (517) 335-9800
 FAX: (517) 335-9600

Sample Number: AB25588 CENTRAL PIT WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
99-09-2	3-Nitroaniline	Not Detected	20		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	2.0		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	5.0		1.0
106-47-8	4-Chloroaniline	Not Detected	10		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	1.0		1.0
100-01-6	4-Nitroaniline	Not Detected	20		1.0
100-02-7	4-Nitrophenol	Not Detected	25		1.0
83-32-9	Acenaphthene	Not Detected	1.0		1.0
208-96-8	Acenaphthylene	Not Detected	1.0		1.0
62-53-3	Aniline	Not Detected	4.0		1.0
120-12-7	Anthracene	Not Detected	1.0		1.0
103-33-3	Azobenzene	Not Detected	2.0		1.0
56-55-3	Benzo[a]anthracene	Not Detected	1.0		1.0
50-32-8	Benzo[a]pyrene	Not Detected	1.0		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	1.0		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	1.0		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	1.0		1.0
100-51-6	Benzyl Alcohol	Not Detected	50		1.0
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	2.0		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	1.0		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	1.0	5	1.0
117-81-7	Bis(2-ethylhexyl)phthalate	21	5.0		1.0
85-68-7	Butyl benzyl phthalate	Not Detected	5.0		1.0
86-74-8	Carbazole	Not Detected	5.0		1.0
218-01-9	Chrysene	Not Detected	1.0		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	2.0		1.0
132-64-9	Dibenzofuran	Not Detected	4.0		1.0
84-66-2	Diethylphthalate	Not Detected	5.0		1.0
131-11-3	Dimethyl phthalate	Not Detected	5.0		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	5.0		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	5.0		1.0
206-44-0	Fluoranthene	Not Detected	1.0		1.0
86-73-7	Fluorene	Not Detected	1.0		1.0
118-74-1	Hexachlorobenzene	Not Detected	1.0		1.0
87-68-3	Hexachlorobutadiene	Not Detected	1.0		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	10	Z	1.0
67-72-1	Hexachloroethane	Not Detected	1.0		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	2.0		1.0
78-59-1	Isophorone	Not Detected	1.0		1.0
121-69-7	N,N-dimethylaniline	Not Detected	5.0		1.0
91-20-3	Naphthalene	Not Detected	1.0		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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 Lansing, MI 48909
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Sample Number: AB25588 CENTRAL PIT WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier:

Volume: 1000

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
98-95-3	Nitrobenzene	Not Detected	2.0		1.0
100-61-8	N-methylaniline	Not Detected	1.0		1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	5.0		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	2.0		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	2.0		1.0
87-86-5	Pentachlorophenol	Not Detected	20		1.0
85-01-8	Phenanthrene	Not Detected	1.0		1.0
108-95-2	Phenol	Not Detected	5.0		1.0
129-00-0	Pyrene	Not Detected	1.0		1.0
110-86-1	Pyridine	Not Detected	20		1.0
632-22-4	Tetramethylurea	Not Detected	1.0		1.0

A library search found no reportable compounds.
 Probable petroleum product(s) present.

Florisil Cleanup	Completed	10/24/2008	3620	DT
Gel Permeation Cleanup	Completed	10/22/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Sample Number: AB25589 CENTRAL PIT #2 (DECANTED)

PCBs as Aroclors

Analytical Method: 8082		Date Tested: 10/25/2008	Analyst: MF	
Extraction Method: 3510		Extraction Date: 10/20/2008	Qualifier: KR	Volume: 300
CAS #	Compound	Result ug/L	RL	Qualifier Dilution Factor
SURROGATE	#Decachlorobiphenyl#	14.7		
SURROGATE	#Tetrachloro-m-xylene#	62.9		
12674-11-2	Aroclor 1016	Not Detected	0.33	1.0
11104-28-2	Aroclor 1221	Not Detected	0.33	1.0
11141-16-5	Aroclor 1232	Not Detected	0.33	1.0
53469-21-9	Aroclor 1242	Not Detected	0.33	1.0
12672-29-6	Aroclor 1248	Not Detected	0.33	1.0
11097-69-1	Aroclor 1254	Not Detected	0.43	K 1.0
11096-82-5	Aroclor 1260	Not Detected	0.33	1.0
37324-23-5	Aroclor 1262	Not Detected	0.33	1.0
11100-14-4	Aroclor 1268	Not Detected	0.33	1.0

Base Neutral Acids with Library Search

Analytical Method: 8270		Date Tested: 10/20/2008	Analyst: SMH	
Extraction Method: 3510		Extraction Date: 10/17/2008	Qualifier: KR	Volume: 300
CAS #	Compound	Result ug/L	RL	Qualifier Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	84.7		
SURROGATE	#2,4,6-Tribromophenol#	107		
SURROGATE	#2-Fluorophenol#	54.0		9
SURROGATE	#Nitrobenzene - D5#	78.8		
SURROGATE	#Phenol - D6#	51.9		9
SURROGATE	#p-Terphenyl-D14#	85.2		
	*Cholestane	46		LB
	*Docosane	16		LB
	*Eicosane	16		LB
	*Heptadecane	51		LB
	*Heptyl-pentadecane	15		LB
	*Hexacosane	21		LB
	*Methyl-tridecane	16		LB
	*Tetramethyl-pentadecane	26		LB
120-82-1	1,2,4-Trichlorobenzene	Not Detected	6.7	1.0
95-95-4	2,4,5-Trichlorophenol	Not Detected	17	1.0
88-06-2	2,4,6-Trichlorophenol	Not Detected	13	1.0
120-83-2	2,4-Dichlorophenol	Not Detected	33	1.0
105-67-9	2,4-Dimethylphenol	Not Detected	17	1.0
51-28-5	2,4-Dinitrophenol	Not Detected	83	1.0
121-14-2	2,4-Dinitrotoluene	Not Detected	17	1.0
606-20-2	2,6-Dinitrotoluene	Not Detected	17	1.0
95-51-2	2-Chloroaniline	Not Detected	17	1.0

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
mg / L : milligram / liter (ppm)
ug / Kg : microgram / kilogram (ppb)
mg / Kg : milligram / kilogram (ppm)

Laboratory Contacts
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Systems Mgmt Unit: George Krisztian



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P.O. Box 30270
 Lansing, MI 48909
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 FAX: (517) 335-9600

Sample Number: AB25589 CENTRAL PIT #2 (DECANTED)

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier: KR **Volume:** 300

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
91-58-7	2-Chloronaphthalene	Not Detected	6.7		1.0
95-57-8	2-Chlorophenol	Not Detected	33		1.0
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	67		1.0
91-57-6	2-Methylnaphthalene	Not Detected	17		1.0
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	33		1.0
88-74-4	2-Nitroaniline	Not Detected	67		1.0
88-75-5	2-Nitrophenol	Not Detected	17		1.0
108394,106445	3 & 4-Methylphenol	Not Detected	67		1.0
99-09-2	3-Nitroaniline	Not Detected	67		1.0
101-55-3	4-Bromophenyl phenyl ether	Not Detected	6.7		1.0
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	17		1.0
106-47-8	4-Chloroaniline	Not Detected	33		1.0
7005-72-3	4-Chlorodiphenylether	Not Detected	3.3		1.0
100-01-6	4-Nitroaniline	Not Detected	67		1.0
100-02-7	4-Nitrophenol	Not Detected	83		1.0
83-32-9	Acenaphthene	Not Detected	3.3		1.0
208-96-8	Acenaphthylene	Not Detected	3.3		1.0
62-53-3	Aniline	Not Detected	13		1.0
120-12-7	Anthracene	Not Detected	3.3		1.0
103-33-3	Azobenzene	Not Detected	6.7		1.0
56-55-3	Benzo[a]anthracene	Not Detected	3.3		1.0
50-32-8	Benzo[a]pyrene	Not Detected	3.3		1.0
205-99-2	Benzo[b]fluoranthene	Not Detected	3.3		1.0
191-24-2	Benzo[g,h,i]perylene	Not Detected	3.3		1.0
207-08-9	Benzo[k]fluoranthene	Not Detected	3.3		1.0
100-51-6	Benzyl Alcohol	Not Detected	170		1.0
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	6.7		1.0
111-44-4	Bis(2-chloroethyl)ether	Not Detected	3.3		1.0
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	3.3	5	1.0
117-81-7	Bis(2-ethylhexyl)phthalate	16	17	T	1.0
85-68-7	Butyl benzyl phthalate	Not Detected	17		1.0
86-74-8	Carbazole	Not Detected	17		1.0
218-01-9	Chrysene	Not Detected	3.3		1.0
53-70-3	Dibenz[a,h]anthracene	Not Detected	6.7		1.0
132-64-9	Dibenzofuran	Not Detected	13		1.0
84-66-2	Diethylphthalate	Not Detected	17		1.0
131-11-3	Dimethyl phthalate	Not Detected	17		1.0
84-74-2	Di-n-butyl phthalate	Not Detected	17		1.0
117-84-0	Di-n-octyl phthalate	Not Detected	17		1.0
206-44-0	Fluoranthene	3.6	3.3		1.0
86-73-7	Fluorene	Not Detected	3.3		1.0

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
 mg / Kg : milligram / kilogram (ppm)

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Sample Number: AB25589 CENTRAL PIT #2 (DECANTED)

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier: KR **Volume:** 300

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
118-74-1	Hexachlorobenzene	Not Detected	3.3		1.0
87-68-3	Hexachlorobutadiene	Not Detected	3.3		1.0
77-47-4	Hexachlorocyclopentadiene	Not Detected	33	Z	1.0
67-72-1	Hexachloroethane	Not Detected	3.3		1.0
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	6.7		1.0
78-59-1	Isophorone	Not Detected	3.3		1.0
121-69-7	N,N-dimethylaniline	Not Detected	17		1.0
91-20-3	Naphthalene	Not Detected	3.3		1.0
98-95-3	Nitrobenzene	Not Detected	6.7		1.0
100-61-8	N-methylaniline	Not Detected	3.3		1.0
67-75-9	N-Nitrosodimethylamine	Not Detected	17		1.0
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	6.7		1.0
86-30-6	N-Nitrosodiphenylamine	Not Detected	6.7		1.0
87-86-5	Pentachlorophenol	Not Detected	67		1.0
85-01-8	Phenanthrene	Not Detected	3.3		1.0
108-95-2	Phenol	Not Detected	17		1.0
129-00-0	Pyrene	Not Detected	3.3		1.0
110-86-1	Pyridine	Not Detected	67		1.0
632-22-4	Tetramethylurea	Not Detected	3.3		1.0

Probable petroleum product(s) present.
 1 amber decanted and split for BNA & PCBs.

Florisil Cleanup	Completed	10/24/2008	3620	DT
Gel Permeation Cleanup	Completed	10/22/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB25590 3RD BAY SEDS WATER

PCBs as Aroclors

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#Decachlorobiphenyl#	Not Applicable		V	
SURROGATE	#Tetrachloro-m-xylene#	Not Applicable		V	
12674-11-2	Aroclor 1016	Not Detected	8.3		50
11104-28-2	Aroclor 1221	Not Detected	8.3		50
11141-16-5	Aroclor 1232	Not Detected	8.3		50
53469-21-9	Aroclor 1242	Not Detected	8.3		50
12672-29-6	Aroclor 1248	Not Detected	8.3		50
11097-69-1	Aroclor 1254	Not Detected	8.3		50
11096-82-5	Aroclor 1260	Not Detected	33		50
37324-23-5	Aroclor 1262	32	8.3		50
11100-14-4	Aroclor 1268	Not Detected	12		50

RLs raised due to matrix interference.

Base Neutral Acids with Library Search

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
SURROGATE	#2 - Fluorobiphenyl#	Not Applicable		V	
SURROGATE	#2,4,6-Tribromophenol#	Not Applicable		V	
SURROGATE	#2-Fluorophenol#	Not Applicable		V	
SURROGATE	#Nitrobenzene - D5#	Not Applicable		V	
SURROGATE	#Phenol - D6#	Not Applicable		V	
SURROGATE	#p-Terphenyl-D14#	Not Applicable		V	
	*Hexadecane	54		LB	
120-82-1	1,2,4-Trichlorobenzene	Not Detected	80		20
95-95-4	2,4,5-Trichlorophenol	Not Detected	200		20
88-06-2	2,4,6-Trichlorophenol	Not Detected	160		20
120-83-2	2,4-Dichlorophenol	Not Detected	400		20
105-67-9	2,4-Dimethylphenol	Not Detected	200		20
51-28-5	2,4-Dinitrophenol	Not Detected	1000		20
121-14-2	2,4-Dinitrotoluene	Not Detected	200		20
606-20-2	2,6-Dinitrotoluene	Not Detected	200		20
95-51-2	2-Chloroaniline	Not Detected	200		20
91-58-7	2-Chloronaphthalene	Not Detected	80		20
95-57-8	2-Chlorophenol	Not Detected	400		20
534-52-1	2-Methyl-4,6-dinitrophenol	Not Detected	800		20
91-57-6	2-Methylnaphthalene	Not Detected	200		20
95-48-7	2-Methylphenol (o-Cresol)	Not Detected	400		20
88-74-4	2-Nitroaniline	Not Detected	800		20
88-75-5	2-Nitrophenol	Not Detected	200		20

CAS# : Chemical Abstract Service Registry Number
RL : Reporting Limit
ND : Not Detected

ug / L : microgram / liter (ppb)
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ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB25590 3RD BAY SEDS WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
Extraction Method: 3510

Date Tested: 10/20/2008
Extraction Date: 10/17/2008

Analyst: SMH
Qualifier: KR **Volume:** 500

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
108394,106445	3 & 4-Methylphenol	Not Detected	800		20
99-09-2	3-Nitroaniline	Not Detected	800		20
101-55-3	4-Bromophenyl phenyl ether	Not Detected	80		20
59-50-7	4-Chloro-3-methyl-phenol	Not Detected	200		20
106-47-8	4-Chloroaniline	Not Detected	400		20
7005-72-3	4-Chlorodiphenylether	Not Detected	40		20
100-01-6	4-Nitroaniline	Not Detected	800		20
100-02-7	4-Nitrophenol	Not Detected	1000		20
83-32-9	Acenaphthene	Not Detected	40		20
208-96-8	Acenaphthylene	Not Detected	40		20
62-53-3	Aniline	Not Detected	160		20
120-12-7	Anthracene	Not Detected	40		20
103-33-3	Azobenzene	Not Detected	80		20
56-55-3	Benzo[a]anthracene	Not Detected	40		20
50-32-8	Benzo[a]pyrene	Not Detected	40		20
205-99-2	Benzo[b]fluoranthene	Not Detected	40		20
191-24-2	Benzo[g,h,i]perylene	Not Detected	40		20
207-08-9	Benzo[k]fluoranthene	Not Detected	40		20
100-51-6	Benzyl Alcohol	Not Detected	2000		20
111-91-1	Bis(2-chloroethoxy)methane	Not Detected	80		20
111-44-4	Bis(2-chloroethyl)ether	Not Detected	40		20
108-60-1	Bis(2-chloroisopropyl)ether	Not Detected	40	5	20
117-81-7	Bis(2-ethylhexyl)phthalate	1000	200		20
85-68-7	Butyl benzyl phthalate	Not Detected	200		20
86-74-8	Carbazole	Not Detected	200		20
218-01-9	Chrysene	Not Detected	40		20
53-70-3	Dibenz[a,h]anthracene	Not Detected	80		20
132-64-9	Dibenzofuran	Not Detected	160		20
84-66-2	Diethylphthalate	Not Detected	200		20
131-11-3	Dimethyl phthalate	Not Detected	200		20
84-74-2	Di-n-butyl phthalate	Not Detected	200		20
117-84-0	Di-n-octyl phthalate	Not Detected	200		20
206-44-0	Fluoranthene	Not Detected	40		20
86-73-7	Fluorene	Not Detected	40		20
118-74-1	Hexachlorobenzene	Not Detected	40		20
87-68-3	Hexachlorobutadiene	Not Detected	40		20
77-47-4	Hexachlorocyclopentadiene	Not Detected	400	Z	20
67-72-1	Hexachloroethane	Not Detected	40		20
193-39-5	Indeno(1,2,3-c,d)pyrene	Not Detected	80		20
78-59-1	Isophorone	Not Detected	40		20
121-69-7	N,N-dimethylaniline	Not Detected	200		20

CAS# : Chemical Abstract Service Registry Number
 RL : Reporting Limit
 ND : Not Detected

ug / L : microgram / liter (ppb)
 mg / L : milligram / liter (ppm)
 ug / Kg : microgram / kilogram (ppb)
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Sample Number: AB25590 3RD BAY SEDS WATER

Base Neutral Acids with Library Search

Analytical Method: 8270
 Extraction Method: 3510

Date Tested: 10/20/2008
 Extraction Date: 10/17/2008

Analyst: SMH
 Qualifier: KR
 Volume: 500

CAS #	Compound	Result ug/L	RL	Qualifier	Dilution Factor
91-20-3	Naphthalene	Not Detected	40		20
98-95-3	Nitrobenzene	Not Detected	80		20
100-61-8	N-methylaniline	Not Detected	40		20
67-75-9	N-Nitrosodimethylamine	Not Detected	200		20
621-64-7	N-Nitrosodi-n-propylamine	Not Detected	80		20
86-30-6	N-Nitrosodiphenylamine	Not Detected	80		20
87-86-5	Pentachlorophenol	Not Detected	800		20
85-01-8	Phenanthrene	Not Detected	40		20
108-95-2	Phenol	Not Detected	200		20
129-00-0	Pyrene	Not Detected	40		20
110-86-1	Pyridine	Not Detected	800		20
632-22-4	Tetramethylurea	Not Detected	40		20

RLs raised due to matrix interference.
 Probable petroleum product(s) present.
 1 amber split for BNA & PCBs.

Florisil Cleanup	Completed	10/24/2008	3620	DT
Gel Permeation Cleanup	Completed	10/22/2008	3640	DT

CAS# : Chemical Abstract Service Registry Number
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<u>Qualifier Code</u>	<u>Qualifier Description</u>
1	Result(s) and RL(s) are estimated due to low surrogate recovery.
2	Result is estimated due to high surrogate recovery.
3	Result(s) and RL(s) are estimated due to low matrix spike recovery.
4	Result is estimated due to high matrix spike recovery.
5	Result and RL are estimated due to low continuing calibration standard criteria failure.
6	Result is estimated due to high continuing calibration standard criteria failure.
7	Result(s) and RL(s) are estimated due to poor precision.
8	Result(s) and RL(s) are estimated due to low recovery of batch QC.
9	Result outside QC acceptance criteria.
A	Value reported is the mean of two or more determinations.
C	Value calculated from other independent parameters.
D	Analyte value quantified from a dilution(s); reporting limit (RL) raised.
E	Result is estimated due to high recovery of batch QC.
F	Amenable cyanide was not analyzed due to low level of total cyanide.
G	Result and RL are estimated due to initial calibration standard criteria failure.
H	Recommended laboratory holding time was exceeded.
I	Dilution required due to matrix interference; reporting limit (RL) raised.
J	Analyte was positively identified. Value is an estimate.
JA	Result is estimated due to multiple Aroclors present.
JC	Result is estimated since confirmation analysis did not meet acceptance criteria
JD	Due to severe degradation, specific Aroclor identification is difficult and quantitation is estimated.
K	RL(s) raised due to matrix interferences.
KR	RL(s) raised due to low sample volume submitted.
KS	RL(s) raised due to low total solids.
KW	RL(s) raised due to light sample weight.
LB	Reported library search compounds are tentative identifications with estimated concentrations.
M	The level of the method preparation blank (MPB) is reported in the qualifier column.
N	Non-homogeneous sample made analysis of sample questionable.
O	Result and RL estimated due to analysis from an open vial.
P	Recommended sample collection/preservation technique not used; reported result(s) is an estimate.
Q	Quantity of sample insufficient to perform analyses requested.
R	Result confirmed by re-extraction and analysis.
S	Supernatant analyzed.
T	Reported value is less than the reporting limit (RL). Result is estimated.
V	Value not available due to dilution.
W	Reported value is less than the method detection limit (MDL).
X	Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200°C. 2-Methylnaphthalene & naphthalene have boiling points above 200°C and are better suited to analysis by methods 8270 or 625 as semivolatile organics.
PI	Possible interference may have affected the accuracy of the laboratory result
Z	Result reported below the RL to meet the TDL in RRD Op Memo 2 (10/22/04) multiplied by applicable dilution factor.

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 ND : Not Detected

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GPS Sample Location Coordinates - Water
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
h1	740151.2	317702.4	
H-1	740150.4	317700.7	
W-1	740157.0	317694.2	
H-2	740167.0	317688.1	
W-2	740173.2	317683.3	
H-3	740184.2	317677.2	
W-3	740190.5	317670.8	
W-4	740201.2	317665.6	
H-4	740206.2	317668.5	
W-5	740205.7	317658.6	
H-5	740219.3	317650.0	
H-6	740226.1	317640.8	
W-6	740232.9	317633.9	
H-7	740240.0	317625.0	
W-7	740246.1	317618.4	
H-8	740252.4	317606.7	
W-8	740253.5	317598.0	
W-9	740257.3	317588.1	
H-9	740260.4	317575.6	
W-10	740260.9	317570.3	
H-10	740261.9	317562.4	
W-11	740263.1	317555.0	
H-11	740264.2	317545.2	
W-12	740264.8	317537.1	
H-12	740263.7	317529.3	
W-13	740257.1	317523.5	
H-13	740257.7	317515.2	
W-14	740255.2	317508.5	
H-14	740273.0	317510.3	
H-15	740272.9	317511.6	
H-16	740273.2	317514.2	
H-17	740282.2	317509.9	
H-18	740282.1	317512.0	
H-19	740283.1	317512.8	
H-20	740290.4	317512.5	
H-21	740290.2	317513.6	
H-22	740290.0	317515.0	
H-23	740294.0	317513.3	
H-24	740293.6	317514.6	
H-25	740295.0	317515.2	
H-26	740299.7	317513.6	
H-27	740299.2	317515.0	
H-28	740299.7	317516.2	
H-29	740307.0	317512.8	
H-30	740307.0	317514.6	
H-31	740307.1	317515.1	
H-32	740313.5	317511.0	
H-33	740314.3	317511.2	
H-33	740313.8	317510.9	
H-34	740314.6	317511.8	
H-35	740320.0	317505.3	

GPS Sample Location Coordinates - Water
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
H-36	740321.1	317506.8	
W-15	740246.5	317508.9	
W-16	740239.2	317507.8	
W-17	740231.7	317505.8	
W-18	740223.9	317504.6	
W-19	740216.9	317505.0	
W-20	740210.0	317509.3	
W-21	740203.7	317513.0	
W-22	740195.2	317514.9	
W-23	740186.6	317515.9	
W-24	740177.4	317515.0	
W-25	740170.5	317521.7	
W-26	740163.0	317528.5	
W-27	740154.2	317524.6	
W-28	740146.4	317517.4	
W-29	740141.5	317506.8	
W-30	740132.1	317499.1	
W-31	740125.0	317488.7	
H-37	740330.3	317496.5	
H-38	740335.4	317489.8	
H-39	740340.7	317474.4	
W-47	740108.9	317706.0	
W-48	740032.0	317700.3	
W-49	739968.4	317678.5	
W-50	739907.7	317693.5	
W-51	739906.5	317698.4	
W-52	739834.3	317658.4	
W-53	739743.8	317645.1	
W-54	739745.4	317657.9	
H-40	739683.4	317673.3	
H-41	739624.2	317713.8	
W-55	739566.3	317779.0	
H-42	739536.0	317817.4	
W-56	739510.7	317866.6	
H-43	739491.7	317926.3	
W-57	739486.4	317984.8	
H-44	739493.4	318046.4	
H-45	739503.8	318046.5	
W-58	739479.6	318104.8	
W-32	740121.4	317478.4	
W-33	740115.2	317468.3	
W-34	740110.3	317457.8	
W-35	740108.7	317443.4	
W-36	740103.0	317432.3	
W-37	740101.1	317418.6	
W-38	740094.1	317406.2	
W-39	740087.1	317394.3	
W-40	740084.8	317379.5	
W-41	740082.1	317367.0	
W-42	740075.8	317356.3	
W-43	740070.0	317347.0	

GPS Sample Location Coordinates - Water
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
W-44	740057.4	317339.3	
W-45	740049.5	317333.5	
W-46	740041.8	317328.3	
W-59	739507.2	318166.4	
H-46	739547.5	318194.3	
W-60	739580.6	318235.3	
H-47	739605.8	318282.1	
W-61	739601.1	318333.5	
H-48	739592.8	318366.5	
H-49	739637.2	318356.9	
W-62	739677.7	318323.7	
H-50	739694.9	318307.3	
W-63	739747.4	318282.8	
H-51	739812.5	318255.3	
W-64	739843.5	318220.6	
H-52	739941.8	318204.4	
H-53	740056.2	318224.4	
H-54	740156.5	318272.9	
H-55	740262.9	318310.7	
H-56	740380.1	318339.9	
H-57	740499.1	318301.4	
W-70	740451.0	318318.0	
W-69	740324.2	318343.3	
W-68	740211.2	318288.6	
W-66	740000.2	318210.7	
W-67	740112.3	318249.7	
W-65	739902.1	318203.3	
H-62	740775.4	318042.4	
W-74	740765.5	318075.7	
H-61	740693.0	318102.8	
H-60	740612.9	318134.4	
W-73	740663.9	318105.5	
W-72	740595.5	318182.0	
H-59	740596.8	318237.4	
H-58	740543.6	318285.9	
W-71	740593.4	318289.3	
H-63	740804.2	317985.8	
W-75	740827.2	317942.1	
H-64	740831.8	317875.2	
W-76	740827.0	317828.8	
H-65	740816.2	317780.8	
H-66	740802.4	317739.1	
W-77	740770.1	317698.8	
H-67	740713.2	317690.8	
W-78	740673.2	317672.9	
H-68	740637.8	317647.8	
W-79	740602.2	317635.3	
H-69	740567.6	317592.5	
W-80	740536.8	317585.1	
H-70	740523.3	317555.8	
H-71	740547.6	317534.0	

GPS Sample Location Coordinates - Water
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
h109	740257.6	317513.8	
h108	740255.3	317512.7	
h105	740251.4	317508.6	
h104	740252.2	317511.1	
h103	740252.8	317513.9	
h101	740253.5	317516.6	
h100	740256.5	317517.9	
h102	740250.0	317517.8	
h107	740249.0	317514.4	
h106	740248.9	317511.3	
w16d	740242.2	317507.1	
w16e	740241.9	317509.1	
w16g	740243.7	317509.7	
w16f	740241.8	317510.9	
w16c	740239.7	317510.7	
w16b	740239.9	317508.6	
w16a	740240.4	317506.5	
w16h	740238.7	317508.4	
w16j	740236.3	317509.9	
w16i	740236.6	317507.8	
w16k	740237.5	317506.0	
w16l	740234.9	317507.9	
w16m	740233.2	317506.9	
w16n	740231.3	317506.6	
w16o	740229.0	317506.3	
h1	740152.6	317702.4	Corrected
H-1	740151.2	317700.7	Corrected
W-1	740157.0	317694.2	Corrected
H-2	740166.6	317687.7	Corrected
W-2	740173.2	317683.3	Corrected
H-3	740184.2	317677.2	Corrected
W-3	740190.5	317670.8	Corrected
W-4	740201.2	317665.6	Corrected
H-4	740206.2	317668.5	Corrected
W-5	740205.7	317658.6	Corrected
H-5	740219.3	317650.0	Corrected
H-6	740226.1	317640.8	Corrected
W-6	740232.9	317633.9	Corrected
H-7	740241.2	317624.6	Corrected
W-7	740245.5	317617.4	Corrected
H-8	740251.6	317605.9	Corrected
W-8	740253.5	317598.0	Corrected
W-9	740257.3	317588.1	Corrected
H-9	740260.4	317575.6	Corrected
W-10	740260.9	317570.3	Corrected
H-10	740261.9	317562.4	Corrected
W-11	740263.1	317555.0	Corrected
H-11	740264.2	317545.2	Corrected
W-12	740264.8	317537.1	Corrected
H-12	740263.7	317529.3	Corrected
W-13	740257.1	317523.5	Corrected

GPS Sample Location Coordinates - Water
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
H-13	740257.7	317515.2	Corrected
W-14	740255.6	317509.3	Corrected
H-14	740274.2	317509.6	Corrected
H-15	740274.3	317511.2	Corrected
H-16	740274.3	317513.8	Corrected
H-17	740283.6	317509.6	Corrected
H-18	740283.6	317511.6	Corrected
H-19	740283.6	317513.3	Corrected
H-20	740291.8	317512.0	Corrected
H-21	740291.5	317513.5	Corrected
H-22	740291.4	317514.7	Corrected
H-23	740295.7	317513.1	Corrected
H-24	740295.4	317514.2	Corrected
H-25	740295.6	317515.7	Corrected
H-26	740299.6	317513.6	Corrected
H-27	740299.4	317514.9	Corrected
H-28	740299.8	317516.0	Corrected
H-29	740307.4	317512.7	Corrected
H-30	740307.6	317514.1	Corrected
H-31	740307.8	317514.8	Corrected
H-32	740313.9	317511.1	Corrected
H-33	740314.9	317511.7	Corrected
H-33	740314.7	317511.4	Corrected
H-34	740315.4	317512.3	Corrected
H-35	740321.2	317505.0	Corrected
H-36	740322.2	317506.4	Corrected
W-15	740247.3	317508.2	Corrected
W-16	740240.3	317507.1	Corrected
W-17	740232.9	317505.4	Corrected
W-18	740225.0	317503.8	Corrected
W-19	740218.0	317504.6	Corrected
W-20	740211.1	317508.8	Corrected
W-21	740204.9	317512.4	Corrected
W-22	740196.5	317514.2	Corrected
W-23	740187.7	317515.2	Corrected
W-24	740178.5	317514.5	Corrected
W-25	740171.6	317521.3	Corrected
W-26	740164.1	317527.8	Corrected
W-27	740155.3	317524.0	Corrected
W-28	740147.5	317516.8	Corrected
W-29	740142.5	317506.1	Corrected
W-30	740133.2	317498.5	Corrected
W-31	740126.3	317488.1	Corrected
W-100 (CORE 11)	740826.7	317856.9	
BRIDGE-1	740287.3	317511.2	

GPS Sample Location Coordinates - Soil
 Lake Linden GSI Investigation
 August 4th-8th 2008

Name	Northing	Easting	Notes
SS1	739104.1	316678.1	
SS2	739107.4	316675.8	
CORE-1	740260.6	317509.1	
CORE-2	740262.2	317508.0	
CORE-3	740268.6	317508.0	
CORE-4	740285.7	317509.3	
CORE-5	740292.6	317511.3	
CORE-6	740298.2	317513.3	
CORE-7	740305.3	317511.4	
CORE-8 (W16)	740237.5	317508.0	
CORE-1	740262.0	317508.6	Corrected
CORE-2	740263.7	317507.4	Corrected
CORE-3	740270.0	317507.4	Corrected
CORE-4	740286.9	317509.0	Corrected
CORE-5	740293.8	317511.0	Corrected
CORE-6	740298.2	317513.3	Corrected
CORE-7	740306.9	317511.1	Corrected
CORE-8 (W16)	740239.2	317507.4	Corrected
CORE-11 (W100)	740827.2	317856.8	

GPS Sample Location Coordinates - Features
Lake Linden GSI Investigation
August 4th-8th 2008

Name	Northing	Easting
6-8 IN. ROUND DISCHARGE	740826.6	317857.2
POLE-STAKE (BY CEDAR TREE)	739904.6	317720.3
DOCK CORNER	740170.7	317678.4
DOCK CORNER	740171.6	317677.8
sdiewalk edge	740289.5	317494.5
DOCK CORNER	740041.0	317326.0
DOCK TURN	740032.5	317320.5
DOCK TURN	740029.0	317321.1
GRAY CLAY SMALL MOUND	740149.7	317649.4
RED CLAY BIG BOWL (Edge)	740148.8	317640.2
RED CLAY BIG BOWL (10-12 Ft. Diameter)	740150.5	317634.0
GRAY CLAY SMALL MOUND	740154.4	317651.4