# Final
# Phase II Investigation Report
# of the Dussault Foundry Site
# Lockport, New York

**September 2002**

**Volume I**

***Prepared for:***

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# List of Abbreviations and Acronyms

| | |
|---|---|
| ASC | Analytical Services Center |
| AST | aboveground storage tank |
| DUSR | Data Usability Summary Report |
| DVS | Data Validation Services, Inc. |
| E & E | Ecology and Environment, Inc. |
| EPA | United States Environmental Protection Agency |
| GC/MS | gas chromatograph/mass spectrometer |
| HASP | Health and Safety Plan |
| IPA | isopropyl alcohol |
| µg/kg | micrograms per kilogram |
| µg/L | micrograms per liter |
| PAH | polycyclic aromatic hydrocarbons |
| PCB | polychlorinated biphenyl |
| PID | photoionization detector |
| ppm | parts per million |
| ppt | parts per thousand |
| QAPP | Quality Assurance Project Plan |
| SAMP | Sampling and Analysis Plan |
| SVOC | semivolatile organic compound |
| TAGM | Technical and Administrative Guidance Memorandum |
| TCE | trichloroethene |
| TCL | Target Compound List |
| TIC | tentatively identified compound |
| UST | underground storage tank |
| VOC | volatile organic compound |

# Executive Summary

Ecology and Environment, Inc. (E & E), and Foit-Albert Associates, Inc., under contract to the Niagara County Department of Planning, Development, and Tourism, conducted a Phase II Environmental Site Assessment (Phase II) of the Dussault Foundry Site, located in the City of Lockport, Niagara County, New York. The purpose of this Phase II was to determine if hazardous substances were present on site.

The Dussault Foundry site operated on a 5.6-acre land parcel overlooking the Niagara Escarpment for approximately 83 years, starting in 1912. A Phase I assessment of the property conducted in 2000 noted that several of the foundry's processes used a variety of hazardous materials and generated extensive quantities of molding sand, which likely contains phenols. One underground storage tank (UST) and evidence of a second UST were noted in that study. That report concluded that a Phase II should be conducted at this site to determine if a chemical hazard exists.

This Phase II field program consisted of the following major efforts:

- Geophysical surveying;
- A raceway investigation;
- A drum inventory;
- Estimating the volume of molding sand on site;
- Surface soil sampling at locations suspected to potentially have received hazardous materials, including the railway area, outdoor molding sand piles; the electrical transformer location; raceway soils; and background soils;
- Sampling of soils beneath the concrete floor;
- Sampling of sump water and sediment; and

- Sampling of soil around a UST.

The geophysical survey concluded that a UST was not located in the area of the site between the buildings and the railroad tracks, or west of the buildings. The raceway investigation revealed one raceway was located northeast of the site, and an open channel was once located approximately half way between the northern site boundary and the bottom of the escarpment, to the north. No other raceways were identified on site. The drum inventory determined that 243 drums were present on site; mostly in good or fair condition. The volume of molding sand present on site, not including miscellaneous volumes present inside the buildings, was estimated to be 10,500 cubic yards. Note that this estimate was based on field data gathered using very basic means; an accurate estimate could be developed through use of a site topographic survey.

Eleven test pits were excavated to determine the thickness of the molding sand. Excavation depths ranged from 3 to 11 feet below ground surface. Although some moist soils were encountered, no appreciable free-flowing groundwater was found in any of the pits.

Chemical analysis of site surface soil showed the railroad area samples to be enriched in polycyclic aromatic hydrocarbons (PAHs). Soil collected around an isopropyl alcohol UST was found to contain alcohol and acetone, indicating the tank has leaked. Total phenol concentrations in molding sand were found to be below cleanup concentrations. Elevated chromium, copper, iron, and nickel concentrations in the sand may require regulatory agency involvement when planning a molding sand management plan. Enrichment of zinc in soils below a drain pipe indicates a zinc source in the vicinity, although the exact zinc source can not pinpointed based solely on one soil sample.

Although no evidence of a polychlorinated biphenyl (PCB) release was discovered outside the building, PCBs were detected in subfloor soil and in the sediment of a sump at the electrical control room area. The detected concentrations were below regulatory criteria action levels.

Hazardous substances are present on site. These prevailing waste issues will need to be considered for future site plans.

# 1 Introduction

## 1.1 Phase I Purpose

A Phase I Environmental Site Assessment (Phase I) conducted in 2000 concluded that the environmental site conditions of the Dussault Foundry site warranted further study. The overall purpose of this Phase II Environmental Assessment (Phase II) was to determine whether hazardous substances are present at the Dussault Foundry Site in Lockport, New York. This investigation was designed in accordance with United States Environmental Protection Agency (EPA) Region II's *Draft Brownfields Project Planning Guidance, Volume 1: Targeted Brownfields Assessment Overview* in order to accomplish the project objectives. Ecology and Environment, Inc. (E & E) teamed with Foit-Albert Associates to conduct this Phase II.

Investigation activities described in the *Work Plan for a Phase II Site Environmental Assessment at the Dussault Foundry Site, Lockport, New York* (E & E 2001) were conducted to meet the project's purpose. Variations in work scope activities were conducted in accordance with the field conditions and with the agreement of the Niagara County Brownfields Coordinator, who was the County's project manager.

## 1.2 Site Background

### 1.2.1 Site Description and Surrounding Land Uses

The Dussault Foundry Site consists of a 5.6-acre lot located at 2 Washburn Street in the City of Lockport, Niagara County, New York (see Figure 1-1). The site is located on high land approximately 1/8 mile south of the Erie Canal; an active waterway bisecting the City of Lockport. Approximately 60 percent of the site is occupied by buildings. A hillside sloping downward to the north lies adjacent to the northern side of the buildings, slightly beyond the northern property line. There are no open surface water bodies on site. An actively used railroad track traverses the southern property boundary, while the northern perimeter and the western and eastern ends of the site are wooded. The northern end of Washburn Street abuts the central part of the site. Figure 1-2 presents a site base map showing building locations and other site features.

The site contains two one-story building areas, which formerly housed the foundry and other manufacturing operations. The eastern area consists of a one-story concrete concrete-block structure. The western building cluster consists of concrete block, wooden, and sheet metal structures all connected to one another. According to the former president of the company, prior to the site's current configuration, the subject property was divided into two properties, one on either side of Washburn Street (Foit-Albert 2000).

Union Street borders an easement south of the railroad tracks at the southern site boundary. The remains of the Lockport Union Station train depot are located southeast of the site, while various businesses are located along Union Street southwest of the site.

## 1.3 Site History

The Dussault Foundry operated on the site from approximately 1912 to 1995, manufacturing cast iron and ductile steel (Foit-Albert 2000). Following the business' closing, machinery was sold for salvage value. No other businesses have moved in or occupied any part of the site since the Dussault Foundry closure (Foit-Albert 2000).

Sanborn Fire Insurance maps reviewed during the Phase I indicate that prior to Dussault Foundry's operations at the site, a planing mill and cigar box manufacturing facility were located on the western portion of the site. The 1938 Lockport City Directory listed a fuel company with the same address as the subject property, and coal was reported to have been stored in the area of the site where the core room addition is now located (see Figure 1-2). The city directory also listed a restaurant located on the portion of property east of Washburn Street. The buildings have been vacant since 1995 when Dussault Foundry declared bankruptcy.

The Phase I report (Foit-Albert 2000) contains extensive data concerning site operations; the following site descriptions are excerpted from that report. As part of the Phase I investigation, the former president of Dussault Foundry, Mr. James Maxwell, was interviewed to obtain site operations data.

The Phase I report states the sheet metal Quonset hut was used as a wood shop for pattern making. (This building is identified as Area 1 on Figure 1-2). Since the closing of the Dussault Foundry, the contents of this building were set on fire by vandals. Charred debris and other trash is scattered on the ground throughout the building.

The western-most portion of the foundry building, called the "Core Room Addition," was used for storage of wood and patterns (see Area 2 of Figure 1-2). This area of the building contains numerous 55-gallon drums, pallets, patterns, and a large quantity of debris. A ramp into the building is located in the southwest corner of the addition. Several heat resistant panels used for baking cores are located

at the base of the ramp. According to Mr. Maxwell, this portion of the building was likely the location where the railroad company originally stored coal. A machine shop is located within the southeast corner of the Core Room Addition. This area is identified on Figure 1-2 as Area 3. Several drums and other debris are scattered throughout this area. Mr. Maxwell reported that 30-weight oil used in compressors was stored in this area. A 550-gallon aboveground storage tank (AST) located on the outside of the building, south of this area, was reported to contain linseed oil.

Area 4 within the foundry building is a large open space that formerly housed a variety of large machines used in the foundry process. An AST containing tolusulfuric acid is located on the east side of the wall dividing this area from the machine shop. South of this tank is an oven that was used to bake cores at 400 degrees Fahrenheit. A second tolusulfuric acid tank is positioned along the south wall of Area 4.

A small office and an electrical distribution room are located north of the Quonset hut in Area 4. Empty barrels formerly containing silicon carbide are located outside of this office. Mr. Maxwell noted that the bins located along the southern wall of this area facilitated dumping of scrap iron into the building. He also reported that only "no-bake" molds were used in Areas 1 through 4. The melting furnace was at one time located in Area 4 near the Quonset hut.

The Phase I reports the eastern end of the foundry building (Area 5) was used to house the chemical sand and sand reclamation processes. Much sand was noted in this area during the Phase II investigation.

The cleaning building (Area 6) located on the eastern portion of the property was used for sand reclamation. This building housed a dust collector, shot blast machine, and an electric furnace. Various types of debris were noted scattered throughout this building during the Phase I investigation, in addition to several 55-gallon drums.

The Phase I reports spent foundry sand was removed from the cleaning building, Area 6, and disposed of on that building's east side. This disposal area is identified on the site plan as Area 7 (see Figure 1-2).

The Niagara Escarpment is located north of the buildings, and is identified as Area 8 on the site base map (see Figure 1-2). Several areas along the escarpment appear to be raised in elevation; this may result from foundry sand disposal in the area. Construction debris was also noted scattered throughout the escarpment area.

The Phase I reports that the two ASTs located south of the Quonset hut in Area 1 formerly stored phenol resins. Also, a UST located south of the maintenance area, Area 3, reportedly contains isopropyl alcohol (IPA).

### 1.3.1 Previous Investigations

The Phase I was conducted for this site in February 2000. As part of that assessment effort, available historical data were obtained and reviewed. (Refer to Section 3.3 of the *Phase I Environmental Site Assessment* [Foit-Albert 2000] for further details on site history.)

Another Phase I report was conducted by Ecology and Environment Engineering, P.C. for the New York State Department of Environment Conservation (NYSDEC) in June 1989. The report focused on the foundry sand present on site. The following information is excerpted from that report:

- Dussault Foundry hired Advanced Environmental Systems, Inc. to analyze the sand for metals and phenols using the EPA's extraction procedure toxicity (EP-Tox) method. Phenol concentrations ranged form 0.1 to 0.66 parts per million (ppm) (E & E PC 1989).

- In March 1981, Dussault Foundry subsequently filed an application with NYSDEC for Approval to Construct a Solid Waste Management Facility on site. However, this application was not approved.

- An Industrial Chemical Survey submitted by Dussault in January 1984 reported molding sand was being shipped off site by Browning-Ferris Industries. (However, it is not known how long this off-site disposal lasted.)

- In September 1984, Dussault Foundry submitted a Hazardous Waste Disposal Questionnaire to NYSDEC stating that only nonhazardous waste was being disposed of on site.

- In March 1985, NYSDEC notified the foundry that the 2 Washburn Street site was listed on NYSDEC's Registry as a suspected hazardous waste site.

- In July 1985, Dussault hired Advanced Environmental Systems to analyze foundry sand using the EP-Tox analytical method. Phenol concentrations were reported to be 0.3 ppm to 0.34 ppm.

- In March 1986, Niagara County applied to NYSDEC for approval of a permit to dispose of an industrial waste stream from the Dussault Foundry. The permit for foundry sand disposal at the Niagara County Landfill was approved. (Note that despite the shipment of sand off site, some sand remained on site.)

- In October 1986, Dussault hired Wendel Engineering to prepare a closure plan for the foundry sand storage area.

- In December 1986, NYSDEC cited Dussault for operating a landfill without a permit and ordered Dussault to close the landfill.

- In January 1987, the EPA collected 10 soil samples at various locations on the Dussault Foundry property. These samples confirmed the presence of semi-volatile organic compounds (SVOCs) in site soils. Also, one sample contained VOCs.

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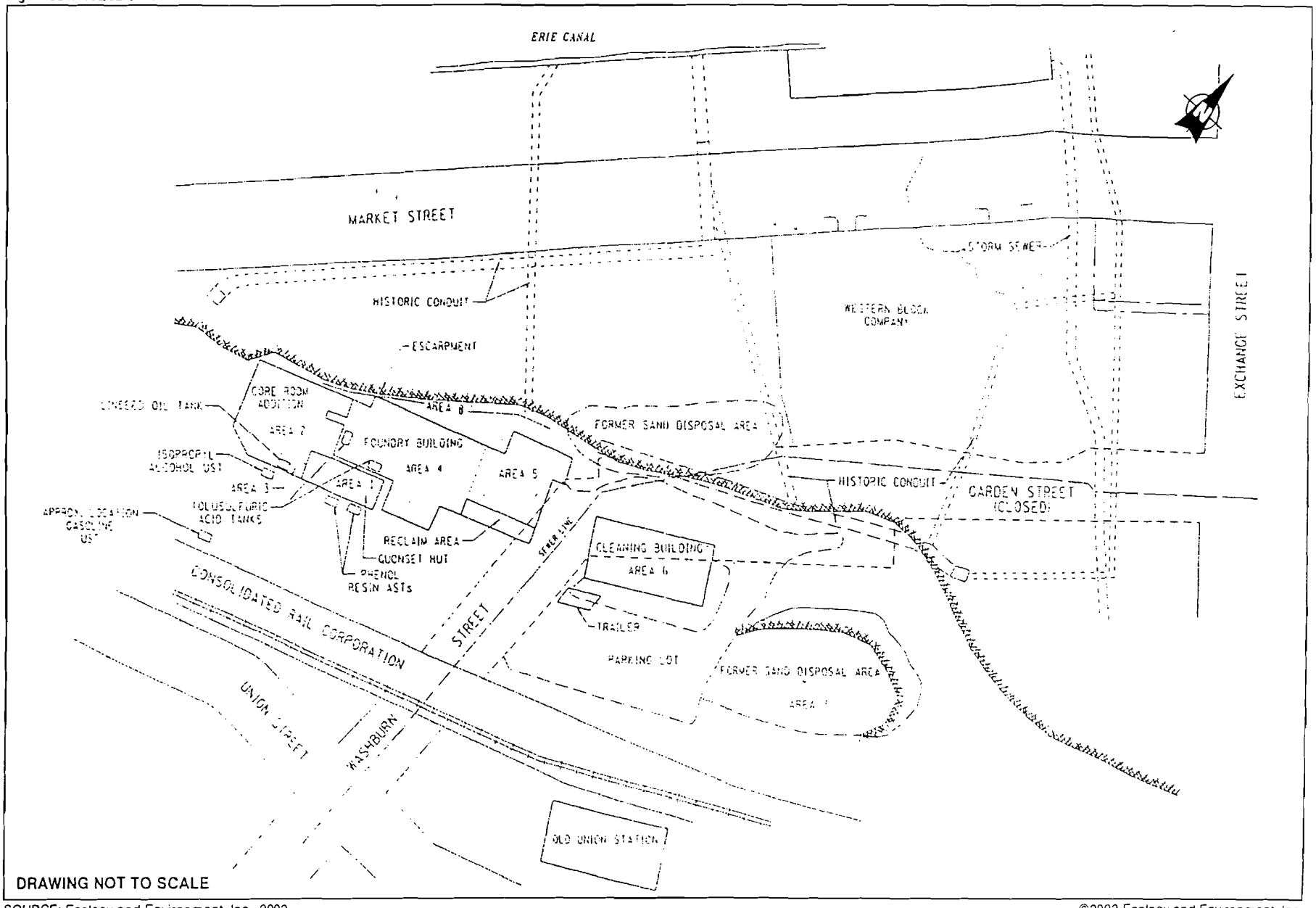
Fig1-1.cdr-4/02/02-GRA


SOURCE: Ecology and Environment, Inc. 2002



Figure 1-1 SITE LOCATION MAP
DUSSAULT FOUNDRY SITE
LOCKPORT, NEW YORK




SOURCE: Ecology and Environment, Inc., 2002



Figure 1-2 SITE BASE MAP
DUSSAULT FOUNDRY SITE
LOCKPORT, NEW YORK

# 2 Phase II Investigation Field Activities

## 2.1 Introduction

The Phase II investigation at the Dussault Foundry Site consisted of conducting various field activities to evaluate various physical and chemical site characteristics. Investigation activities included: a site reconnaissance, a historical records search on site raceways; a drum inventory; surface soil, subsurface soil, and sediment sampling; foundry sand volume estimation; and a geophysical survey. Investigation efforts were grouped and scheduled in a logical sequence such that data from one effort were used in a successive effort.

All field activities were conducted by an E & E field team leader and an assistant from either E & E or from Foit-Albert Associates. SLC Environmental, Inc., of Lockport, New York, was subcontracted to conduct excavation activities during the investigation.

In accordance with the site-specific Health and Safety Plan (HASP), a health and safety officer was on site throughout all field events to ensure that personnel were protected from both physical and chemical health hazards. Appropriate protective clothing was worn by site workers when they were performing intrusive activities to protect themselves from contamination and to prevent cross-contamination between sample locations. A photoionization detector (PID) was used to measure volatile organic compound (VOC) vapor concentrations in the workers' breathing zone, in test trenches, and from soil samples. In addition to the PID, an oxygen/explosimeter and a rad-mini radiation detector were also used to monitor explosive conditions and to detect radiation sources, if present, respectively. Neither explosive air quality conditions nor radiation readings above background concentrations were detected in any part of the site during Phase II investigation activities.

The approach to these activities is described below in Sections 2.2 through 2.6. Unless otherwise noted, all field activities were conducted in accordance with the Sampling and Analysis Plan (SAMP), Quality Assurance Project Plan (QAPP), and HASP included in the November 2001 Work Plan.

## 2.2 Geophysical Survey

The Phase I investigation reported a buried tank exists on site. While no specific location data were available, the former site owner indicated that he believed the tank was located at the western end of the property, roughly between the building and the railroad tracks. A geophysical survey was conducted on November 22 and 23, 2001 to determine the location of this tank.

An E & E team installed a survey grid which started near the southwest corner of the property, adjacent to the existing rail road tracks, and extended east to Washburn Street and north to the building. It also included most of the area west of the western end of the buildings. The grid had an internodal spacing of 25 feet and was marked in the field by pin flags and orange spray paint. Figure 2-1 shows this survey grid.

The team used a Geonics, Ltd. Model EM-31 electromagnetic conductivity meter to measure subsurface conductivities at grid nodes. Electromagnetic measurements (quadrature-phase and in-phase components) were collected at each grid node. Electromagnetic quadrature-phase readings were recorded in units of milliSiemens per meter. Electromagnetic in-phase component readings (which represent the ratio between the primary magnetic field generated by the EM31 and the secondary magnetic field generated in the earth) were recorded in units of parts per thousand (ppt).

All instrument readings were stored electronically in the instrument as they were collected. Following survey completion data were subsequently downloaded using software provided with the instrument, then processed and plotted using Surfur Version 6.0 (Golden Software 1995). Figure 2-1 shows this survey grid; Geophysical survey data plots are presented in Appendix A.

The survey data did not indicate the presence of a buried steel tank anywhere in the southern or southwestern portion of the property. Small electromagnetic anomalies was detected at two grid points, (125,25) and (175, 25), located in the southwest area. A significant anomaly was detected at node (475,75). Excavations were conducted at each of these locations to explore the anomaly sources; findings of all three excavations are discussed in Section 2.4.9.

## 2.3 Raceway Investigation

Phase I findings indicated three manmade water channels, termed raceways, may exist on the site. Concern arose over the possibility that these raceways contained site effluent. An investigation effort targeting these historic site features was thus included in the work scope. This Raceway Investigation effort consisted of a two-step process. First, a historical data gathering effort was undertaken to gather specific information as to the channel depth, width, and location. The second part consisted of a field sample collection effort.

A record search for available historical data on raceways was conducted on November 29 and 30, 2001 by E & E. The Lockport Historical Society; the Niagara County Historical Society, and a retired City of Lockport engineer were all contacted to learn more about the location and configuration on the site. The records obtained included a photocopy of a local raceway map, a photo of the channel north of Market Street, northwest of the site; and a 1974 City of Lockport Sewer Map showing historic hydraulic raceway locations in the site vicinity.

The data from these records were used to assist in developing an understanding of the raceway locations, and to guide the field team in their selection of sample locations. The findings also indicated that there were no open raceways on site. The nearest open raceway was located approximately half way between Market Street and the site along the embankment north of the site buildings.

The second part of the raceway investigation consisted of trying to locate the raceways on site. Relic indications of only one raceway were identified. The foundation of a small mill building (suspected of being some type of a mill) was found approximately 100 feet north of the escarpment, northeast of the Cleaning Building. A narrow (2-foot wide) archway located at the base of this stone building foundation indicated a water outlet path. A fence line marking two abutting properties to the north was recognized as existing as shown in the site base map. A ditch was noted traversing the western side of that property fence from near the top of the hillside down to a short drop-off topographically uphill from Market Street. At the drop-off, a rusty iron trough was noted extending from the ditch toward Market Street, as depicted on the site base map. Collectively, these field findings indicated the position of one former raceway. Soil sampling at this raceway is discussed in Section 2.4. Note that the uppermost portion of this raceway may be located on site. However, it unquestionably extends off site.

No evidence of any other raceways were found on the site.

## 2.4 Environmental Media Sampling

The site characterization plan was designed to target those site features where contamination of environmental media was most likely. The site sampling approaches used are discussed below. Sample collection was conducted as per the methodology described in the Work Plan (E & E 2001), unless otherwise noted. Table 2-1 summarizes the sample locations, sample numbers, collection dates, and analyses. Sample locations are shown in Figure 2-2. Sample analytical data are presented in Section 3. Environmental media sampling was conducted between December 3 and 6, 2001.

### 2.4.1 Former Rail Yard Surface Soil Investigation

Composite surface soil sampling was conducted at four locations selected within the former rail yard area to evaluate possible ash/coal residue/petroleum contamination that may be in the area as a result of the rail yard. Three samples were originally prescribed for the rail area. However, a pile of black-stained dark fine-

grained soil that appeared to be non-native was found at the northern fringe of the rail bed area. As noted below, not all samples originally prescribed for this field program could be obtained. The omission of some samples allowed for adding other sampling. Thus, a fourth soil sample from the rail yard area was collected to evaluate the pile of black-stained soil found on site.

Sample locations RR01 and RR02 were cleared of railroad ballast and vegetation using a hand shovel. The third sample location, RR03, was the additional sample collected at a stained soil pile. The sample was collected directly from this un-vegetated area. The forth sample location, RR04, was collected using a stainless-steel spoon in a stained soil zone found adjacent to an excavation of a trench at a geophysical anomaly area.

Samples from locations RR01 through RR04 (sample numbers DF-RR01-SO through DF-RR04-SO), along with a duplicate sample (DF-RR02-SD), consisted of black-stained fine-grained silty soils; locations RR01, RR02, and RR04 also contained minor gravel. As per the Work Plan, composite samples were collected at each of these rail yard sample locations using the sample collection methodology described in the Work Plan. All samples were submitted for the analyses specified in the work plan.

### 2.4.2 Background Surface Soil Sampling

Three background composite surface soil samples (DF-BK01-SO through DF-BK03-SO) were also collected to provide data for comparative purposes. Although these samples were originally planned for collection in the eastern part of the site, railroad ballast and other signs of disturbed vegetation indicated background conditions did not prevail in that area. At the advice of the Niagara County project manager, the background soil samples were collected at the base of the railroad embankment, just north of Union Street. He stated that although that land is not part of the site, it is publicly owned. Three five-point composite surface soil samples were collected from this background area and submitted for the analyses prescribed in the Work Plan.

In addition to the field background samples, a trip blank sample (DF-TB01-WT) and a rinsate blank sample (DF-BK04-WR) were also collected and submitted for analysis, as per the project Quality Assurance/Quality Control (QA/QC) plan.

### 2.4.3 Molding Sand Sampling

Molding sand generated during site operations was found throughout much of the site during investigation activities. For characterization purposes, four sample locations were selected to evaluate the chemical nature of this material. The locations were selected to assess possible variations in sand contents. Location MS01 was positioned at the far western end of the site in an area now covered by many trees. Presence of these trees in that part of the site suggests that sand is the older sand on site.

Samples MS02 and MS03 were each collected from two sand piles located east of the cleaning room; a northern pile and a southern pile. One sample was collected from each of these piles, as they are suspected to represent the newer sand.

Molding sand sample location MS04 was located at an excavation in the embankment, due north of the eastern end of the Area 5 building.

All four molding sand samples (sample numbers DF-MS01-SO through DF-MS04-SO) were submitted for the analyses prescribed in the Work Plan. Analytical data is presented in Section 3.

### 2.4.4 Raceway Soil Sampling

One soil sample (DF-RW01-SO) was collected from the bottom of the raceway ditch at the top of the embankment, closest to the Dussault site. It was collected from beneath the archway of the stone foundation, where water was believed to have flowed. This sample point was selected as it is the most upgradient point of exposure for this raceway; the point closest to the foundry property.

While no other raceways were identified, a 10-inch corrugated steel drain pipe extending northwest from the western end of the Core Room addition was found. This drain pipe was positioned such that it may have emptied into a relic raceway located part way down the escarpment banking. One soil sample, DF-RW02-SO was collected at the opening of this drain pipe, as shown on Figure 2-2.

### 2.4.5 Additional Surface Soil Sampling

Two additional five-point composite surface soil samples were collected based on the field conditions observed. Sample DF-SS01-SO was collected at the northern and eastern perimeter of the concrete pad located at a former electrical substation area. The high electrical demand of a foundry and the presence of a concrete pad enclosed by a fence together indicate electrical transformers were once located on this pad. The age of this foundry indicates the transformers would likely have contained PCBs. The purpose of this sampling was to evaluate the possible presence of PCBs in the surrounding pad soils to determine if a PCB release had occurred, but had not been remediated.

A second composite surface soil sample was collected from the loose molding sand found in an area formerly containing extensive electrical equipment. Former use of this equipment presented concern for PCB presence. Sample DF-SS02-SO was collected from this sand and submitted for PCB analysis.

### 2.4.6 Subfloor Sampling

Ten subfloor soil samples (DF-SUB01-SO through DF-SUB10-SO) and one duplicate sample (DF-SUB03-SD) were collected throughout the buildings to evaluate the potential for site contaminants to have penetrated into the soil underlying the concrete floor. Sample locations were distributed in areas around the building where liquids may likely have been used, transported, or stored. Samples were

collected in the building areas prescribed in the Work Plan and submitted for analyses specific to the former use of the sample area. Table 2-1 lists further details about each sample; sample locations are shown in Figure 2-2.

During the sample location selection process, it was noted that the entire floor was concrete; there were no areas of open soil floor, as indicated in the project Work Plan. Concrete thickness varied from 3 to 7 inches.

### 2.4.7 Pit and Sump Sampling

Four pits containing water were identified within the buildings; three were located in the western building group, and one was in the cleaning building on the east side. The field team numbered these pits from west to east, then collected one water sample from each pit and submitted it for the analyses prescribed in the Work Plan. Sample numbers were assigned based on the pit locations: DF-Sump1-WO through DF-Sump4-WO. One duplicate sample, DF-Sump1-WD was also collected for QA/QC purposes. At the time of sampling, the field team also measured the pH, temperature, and conductivity of the water contained in each pit using a field instrument.

Note that the Work Plan originally called for collection of a series of sediment samples along a draining ditch where historical data indicated a PCB release had occurred. However, the historical data did not indicate the drainage ditch location. Extensive searching by the field crew did not reveal a ditch location, thus the ditch sampling was not conducted.

In order to assess whether specific PCB releases within other parts of the property had occurred in the past, the field team searched for viable sample locations which could potentially indicate a PCB release. In consideration of possible PCB presence in the electrical control room area, the field team chose to sample sediment in the sump around the control room. This selection was based on the premise that any drain line would have to be located at the lowest point in the electrical control room area.

One sediment sample was collected from the bottom of the sump, which is set approximately 2 to 3 feet below the concrete floor of the main operations area. This area had accumulated significant standing water (approximately 1 to 2 feet deep). A thick, black sludge at least 3 inches thick was discovered submerged in the water. One original sample (DF-SED01-DO) and one duplicate sample (DF-SED01-DD) of this sludge were collected and submitted for PCB analysis.

### 2.4.8 PCB Oil and Spill Area Surface Soil Sampling; Transformer Area Sampling

The Work Plan prescribed the collection and analysis of sediments down stream of a documented PCB spill area. However, as noted above in Section 2.4.5, the spill area location was not documented in the spill report. The site was thoroughly searched for a location of what may have been a probably or even possible

location of a PCB-containing fluid release. However, no such area was ever located. With no indications of the approximate position of this spill area, this sampling effort was deleted from the program.

In addition to not being able to locate the PCB spill area, the field team was also unable to locate two on-site electrical transformers reported in the Phase I report. This situation was brought to the attention of the Niagara County project manager, as well as the EPA project representative. The decision was made to eliminate this sampling activity from the work scope pending the discovery of any data indicating the location of these transformers during this field investigation. No such discoveries were made.

While the PCB spill areas were not identified, the former location of an outdoor electrical substation was identified. One soil sample was collected at this location and submitted for PCB analysis, as noted in Section 2.4.5.

### 2.4.9 Subsurface Soil Sampling at USTs

The Work Plan prescribed excavation and sampling of soil around both the IPA UST and the former gasoline tank, assuming its location could be identified during the geophysical survey. However, the gasoline UST was not located. Thus, UST soil sampling was conducted only at the IPA tank, which is located approximately mid-way along the southern exterior wall of the western building group.

A track hoe excavator was used to remove soil around the western end of the IPA tank. The top of the tank was located beneath approximately 1 foot of soil. Soil surrounding the tank consisted of a red crusty silt, indicating that the tank had been installed into a pit excavated into native soil. Soil from beneath the tank yielded a noticeable odor; the photoionization detector (PID) measured a VOC concentration of 226 ppm at the surface of the soil.

E & E collected one original sample (DF-AST1-SO) and one duplicate sample (DF-AST1-SD) from soil immediately beneath the lowest point of the tank's western end. These samples were submitted for IPA and Target Compound List (TCL) VOC analyses. VOC analytical data are presented in Section 3.

Subsequent to sample collection, the excavation was backfilled and the sample location was flagged.

Excavation was performed at three geophysical anomalies at the south side of the site where the alleged gasoline UST was possibly located. The largest anomaly was located at geophysical survey grid node (475,75), roughly perpendicular to the southern side of the western building. No buried steel objects were identified in the area. However, a steel cart was located at the ground surface close to this node.

Excavation at geophysical grid node (125,25) and at (175,25) revealed the presence of a 1-inch galvanized steel pipe at a depth of 26 inches below ground surface. This pipe was followed from near where it passes beneath the railroad tracks (due north of a fire hydrant located along Union Street), bends 90 degrees to parallel the tracks, then later bends due north to enter the building at the western end of the Core Room Addition. The diameter, material, and position of this pipe relative to a fire hydrant indicate that it is a water line, although this prospect was not confirmed.

Detection of this small pipe indicates the geophysical survey equipment was functioning well. It further indicates that if a UST exists within the survey area, it would be detected by the equipment and grid size used.

### 2.4.10 Non-Acid Tank Sampling

The investigation work scope included sample collection of fluids or tank bottoms in each non-acid tank, assuming these fluids were accessible. The field team identified three potential non-acid tanks for sampling: the two phenol resin tanks located outside the Quonset hut and the IPA tank. Attempts were made to collect a sample from a hose attached to the westernmost phenol resin tank. However, this hose was found to contain an insufficient sample volume, and the field team was unable to open the tank valve. Similarly, the team was unable to open the valve of the western tank. The tops of the tanks were bolted shut, preventing access for tank bottom collection. Thus, no samples were collected from either of the phenol resin tanks.

The fill port configuration of the IPA tank was both too narrow and of a design that did not permit access to the tank's contents. The contents of this tank were not sampled.

### 2.4.11 Optional Groundwater Sampling

While deep soils at the test pit located at the northwest corner of the core room addition contained moist soil, appreciable free-flowing overburden groundwater was not encountered during test trench excavation activities. Therefore, the optional Geoprobe drilling and subsequent groundwater sampling described in the Work Plan were not performed.

## 2.5 Drum Inventory

An inventory of all drums located on site was conducted by the sampling team on December 5, 2001, and updated on June 3, 2002. The team noted the size (in gallons), drum material, condition, labeling, percent full, bung/lid presence, and general contents of each drum found both within the buildings as well as outside and along the hillside. All drums were numbered using orange spray paint during inventory. The complete drum inventory is presented in Appendix B. Also, empty drums were marked with a green dot, and most liquid-containing drums were marked with a red dot using spray paint.

## 2.6 Spent Foundry (Molding) Sand Quantification

Foundry sand generated during site operations is present over much of the site. Due to the concern that foundry sand poses a possible environmental concern, an estimate of the volume of spent foundry sand present at the site was made. The site was divided into four areas to facilitate the volume calculation: the western area, the northern embankment, and the eastern embankment and piles located in the eastern part of the site. The western end consists of all property west of the western end of the building and north of the railroad track, and includes the associated portion of the hillside. Note that based on field observations, this estimate includes sand that extends off of the property. The northern embankment includes all sand north of the western buildings. The eastern area includes the area east of the Washburn Street Extension. The sand pile area consists primarily of three distinct sand mounds. The depth of foundry sand was determined through excavation of several test pits.

Volume estimation calculations area presented in Appendix C. Note that all estimates have a large margin of error as they are based solely on the use of a tape measure in the field. At the direction of the client, topographic surveying using highly precise electronic surveying instruments was not included in the Phase II work scope. Also, a scaled site base map was not available.

A Phase I investigation site visit conducted by E & E in 1987 cites a 1981 survey in which 20,000 cubic yards of sand existed on site (E & E PC 1989). The shipment of sand to the Niagara County Landfill for disposal started in approximately March 1986. By June 1987, at the time of the Phase I site inspection, approximately 10,000 cubic yards of sand existed on site (E & E PC 1989).

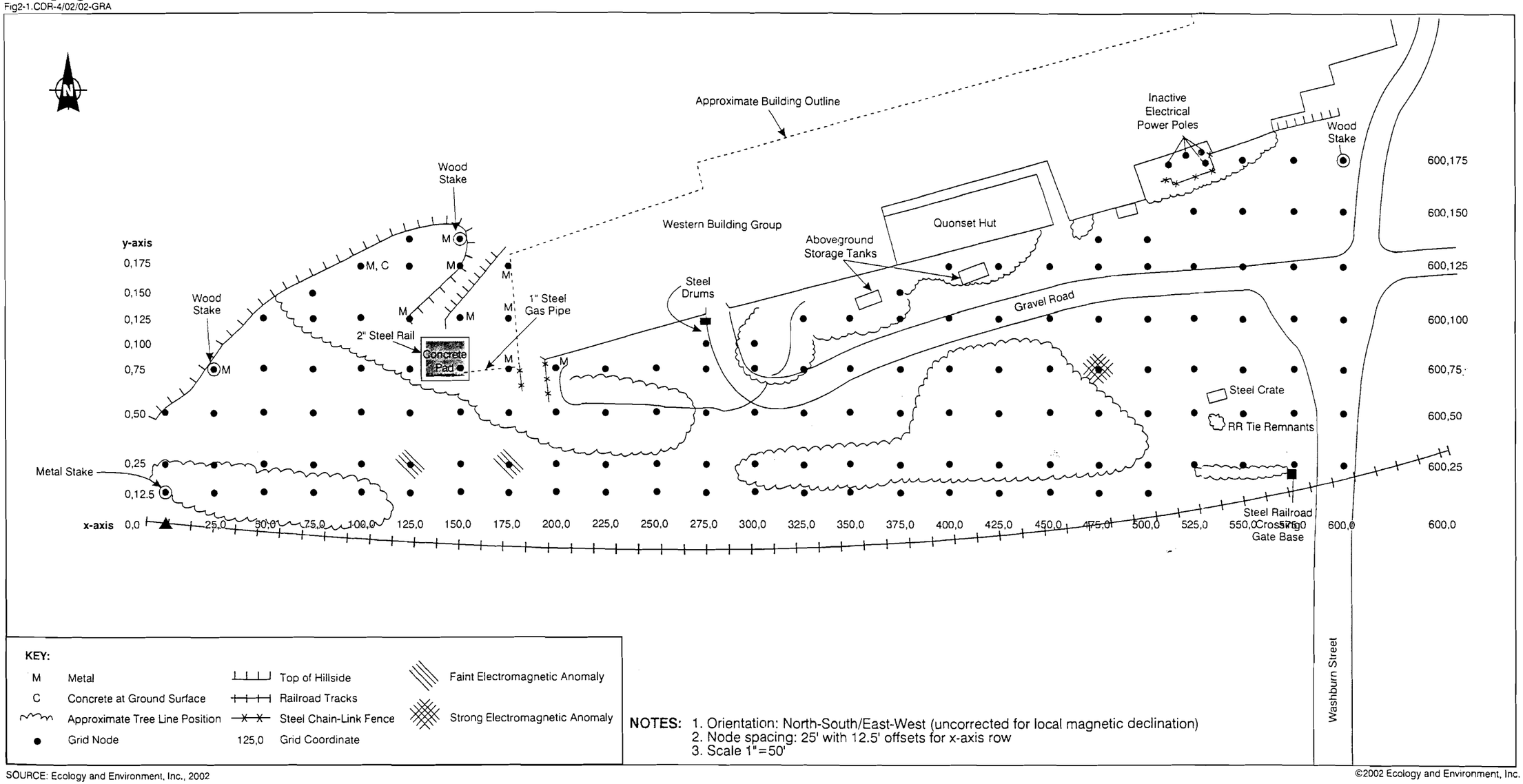
**Table 2-1 Sample Summary, Dussault Foundry Site, Lockport, New York**

| Site Source | Matrix | Analyses | Sample Number | Sample Date | Sample Location | Sample Description | Field PID Reading (ppm) |
|---|---|---|---|---|---|---|---|
| Isopropyl Alcohol UST | Subsurface Soil | TCL VOCs; Isopropyl Alcohol | DF-AST1-SO | 12/4/01 | Western end of isopropyl alcohol tank, at point just below tank bottom | Red fine-grained crusty silt soil yielding an alcohol odor. | 226 |
| | | | DF-AST1-SD | 12/4/01 | Same as DF-AST1-SO | Same as DF-AST1-SO | 226 |
| Rail Yard Soil Samples | Surface Soil | TCL Semivolatiles | DF-RR01-SO | 12/4/01 | 63 feet north of rail bed, 89 feet due south of Area 5. | Black soil | 0 |
| | | | DF-RR02-SO | 12/4/01 | 51 feet north of rail bed, east of Washburn street, 30 feet southeast of fire hydrant | Black sandy loam with fine-grained silt | 0 |
| | | | DF-RR02-SD | 12/4/01 | Same as DF-RR02-SO | Same as RR02 | 0 |
| | | | DF-RR03-SO | 12/4/01 | 49 feet south of southeast corner of building, 20 feet west of Washburn Street. | Black stained soil pile measuring approximately 4 feet by 5 feet by 2 feet thick (maximum) | 0 |
| | | | DF-RR04-SO | 12/5/01 | From excavation 6 area, 120 feet south of building | Black sandy soil | 0 |
| Molding Sand | Sand | TCL Semivolatiles; Total Phenols; TAL Metals; Mercury | DF-MS01-SO | 12/4/01 | Western sand area, 53 feet west of propane tank pad; 1-foot depth interval. | Black fine-grained sand. | 0 |
| | | | DF-MS02-SO | 12/4/01 | Molding sand pile east of Cleaning Room; northeastern pile | Black fine-grained sand. | 0 |
| | | | DF-MS02-SO | 12/4/01 | Same as DF-MS02-SO | Same as DF-MS02-SO | 0 |
| | | | DF-MS03-SO | 12/4/01 | Sand at far eastern end of dirt road leading to eastern end of site. | Black fine-grained sand. | 0 |
| | | | DF-MS04-SO | 12/4/01 | From trench 23 feet northeast of northeast corner of main building | Black fine-grained sand. | 0 |
| Background Surface Soil | Soil | TCL Semivolatiles; Total Phenols; TAL Metals; Mercury | DF-BK01-SO | 12/5/01 | 43 feet north of Union Street, 25 feet east of sample DF-BK02-SO | Black sandy silt loam | 0 |
| | | | DF-BK02-SO | 12/5/01 | 57 feet south of railroad center line, at base of embankment, north of Union Street | Black sandy silt loam | 0 |
| | | | DF-BK03-SO | 12/5/01 | 18 feet west of DF-BK02-SO, 57 feet south of railroad center line. | Black sandy silt loam | 0 |
| Building Sump and Pit Liquids | Sump Water | TCL VOCs; Total Phenols; TAL Metals | DF-Sump1-WO | 12/4/01 | West end of Area 1, near doorway to Core Room Addition | Rusty water with floating oil sheen | 0 |
| | | | DF-Sump1-WD | 12/4/01 | Same as DF-Simp1-WO | Duplicate sample of DF-Sump1-WO | 0 |
| | | | DF-Sump2-WO | 12/4/01 | West of electrical control area in Foundry Building | Dark color; minor sheen present; some floating particles | 0 |
| | | | DF-Sump3-WO | 12/4/01 | At base of electrical control room, Foundry building | Dark color; nothing floating on surface; negligible suspended sediment. | 0 |
| | | | DF-Sump4-WO | 12/4/01 | Sump along north wall in central part of Cleaning Building | Relatively clear; minor cloudiness | 0 |
| Soil From Beneath Building Slab | Soil | Total Phenols | DF-Sub01-SO | 12/5/01 | West end of Quonset Hut | Coarse gravel underlies concrete; crusty reddish silt underlies gravel. | 0 |
| | | Total Phenols; Metals | DF-Sub02-SO | 12/5/01 | Core Room Addition, near southwest corner, in operations area east of ramp leading into addition. | At divide between 2 concrete slabs. Concrete is 6 inches thick; underlain by 1/2 inch of black soil, then red crusty soil. | 0 |
| | | TCL VOCs; Metals; Total Phenols | DF-Sub03-SO | 12/5/01 | Machine shop area | Concrete is reinforced; was in tact throughout area; sample therefor not collected along a fracture. | 0 |
| | | TCL VOCs; Metals; Total Phenols | DF-Sub03-SD | 12/5/01 | Duplicate of sample DF-Sub03-SO | Duplicate of sample DF-Sub03-SO | 0 |
| | | Total Phenols; Metals | DF-Sub04-SO | 12/5/01 | Area 3, north of overhead door | Black soil, then gravel. Concrete is 6 inches thick. | 0 |
| | | TCL VOCs; Total Phenols | DF-Sub05-SO | 12/5/01 | Area 4, open space of Machine Area | Black fine-grained soil. | 0 |
| | | Total Phenols | DF-Sub06-SO | 12/5/01 | Oven area along south wall; | Concrete on top of packed gravel. | 0 |
| | | Total Phenols; TCL PCBs; TAL Metals | DF-Sub07-SO | 12/5/01 | Two feet west of Sump 2, west of electrical room. | Sample was moist; contained powdered concrete. | 0 |
| | | Total Phenols; TAL Metals | DF-Sub08-SO | 12/5/01 | Approx. 75 feet west of overhead door at east end of Area 5 | Very thin concrete (less than 1-inch thick); severely fractured; soil was black, fine-grained silty sand. | 0 |
| | | Total Phenols | DF-Sub09-SO | 12/5/01 | East end of Foundry Building | Fractured concrete; black soil | 0 |
| | | Total Phenols | DF-Sub10-SO | 12/5/01 | Cleaning Building, East end | Concrete contained hair line fractures; soil is black, fine-grained, underlain by gravel. | 0 |

Table 2-1 Sample Summary, Dussault Foundry Site, Lockport, New York

| Site Source | Matrix | Analyses | Sample Number | Sample Date | Sample Location | Sample Description | Field PID Reading (ppm) |
|---|---|---|---|---|---|---|---|
| Raceways | Soil | TCL VOCs, TCL SVOCs, TCL PCBs, TAL Metals | DF-RW01-SO | 12/4/01 | At relic drainage way beneath old mill building foundation, at upstream end of raceway, northwest of site buildings. | Black silty loam, damp; suspected to be native soil | 0 |
| | Soil | TCL VOCs, TCL SVOCs, TCL PCBs, TAL Metals | DF-RW02-SO | 12/5/01 | At end of 10-inch corrugated drain pipe, 52 feet northwest of northwest corner of Core Room Addition | Black foundry sand mixed with black silty loam that appeared to be native. | 0 |
| Sump 3 | Sediment | TCL SVOCs; TCL PCBs | DF-SED01-DO | 12/5/01 | Sludge from water surrounding electrical substation room. | Thick, black, greasy appearance | nm |
| | Sediment | TCL SVOCs; TCL PCBs | DF-SED01-DD | 12/5/01 | Duplicate sample of DF-SED01-DO | Duplicate sample of DF-SED01-DO | nm |
| Outdoor Electrical Substation | Soil | TCL PCBs | DF-SS01-SO | 12/5/01 | Soil from along northern and eastern edges of concrete pad at the former outdoor electrical substation | Black silty loam, damp; suspected to be native soil | 0 |
| Indoor electrical substation | Soil | TCL PCBs | DF-SS02-SO | 12/5/01 | Foundry sand located on top of electrical substation slab, beneath several control panels, at area that appeared to be a former control room. | Black fine-grained foundry sand | 0 |
| Trip Blank | Water | TCL VOCs | DF-TB01-WT | 12/5/01 | Quality control sample | Prepared by laboratory | n/a |
| Rinsate Sample | Water | TCL VOCs, TCL SVOCs, TCL PCBs, TAL Metals | DF-BK04-WR | 12/5/01 | Quality control sample | Prepared by field team | n/a |

02: 001249_FT03_03-B0918
Fig2-1.CDR-4/02/02-GRA

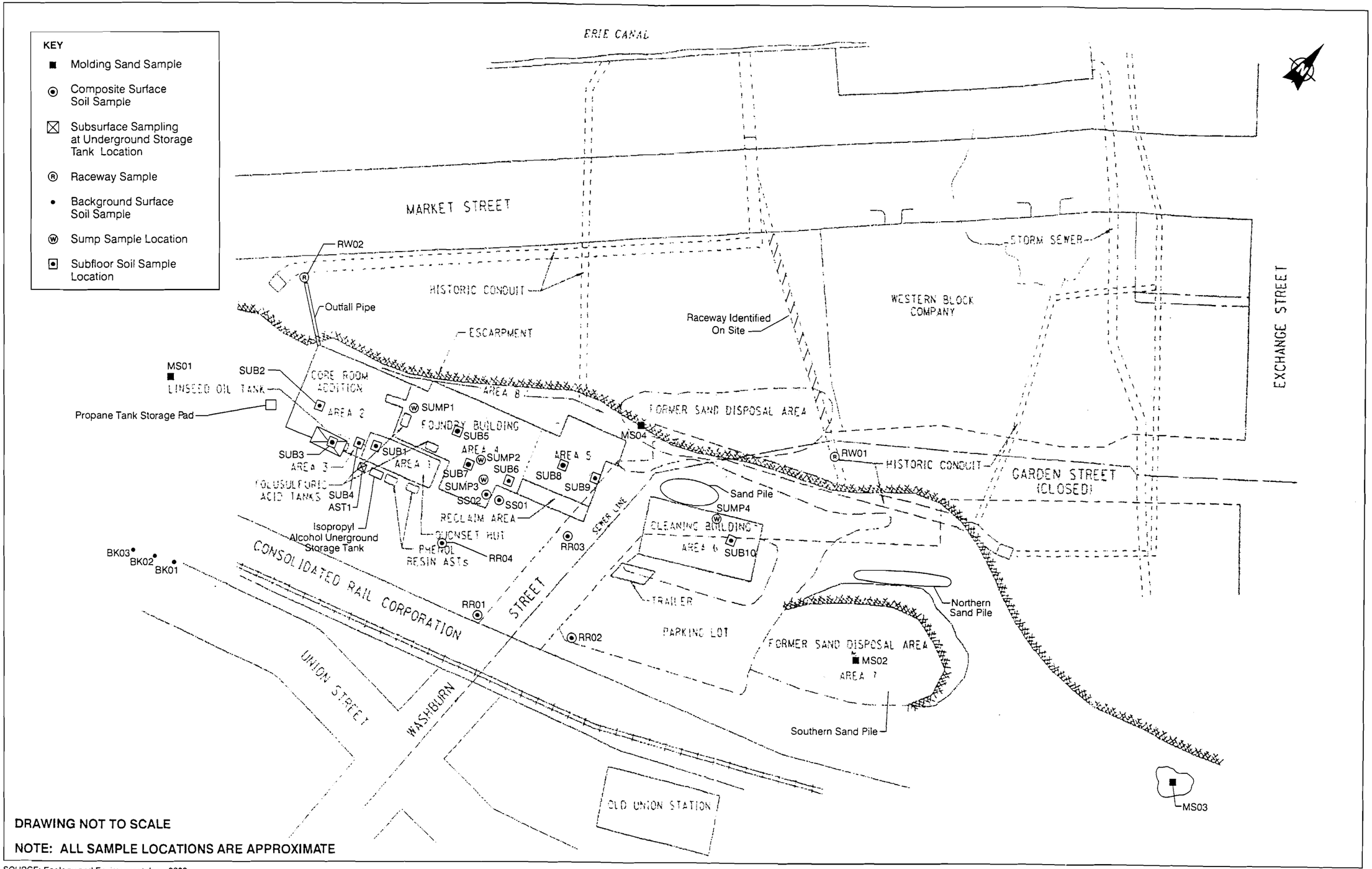



SOURCE: Ecology and Environment, Inc., 2002



**Figure 2-1** GEOPHYSICAL SURVEY GRID, DUSSAULT FOUNDRY SITE, LOCKPORT, NEW YORK

02. 001249_FT03_03-B0918
Fig2-2.CDR-4/02/02-GRA




SOURCE: Ecology and Environment, Inc., 2002



**Figure 2-2** PHASE II SAMPLING LOCATIONS, DUSSAULT FOUNDRY SITE, LOCKPORT, NEW YORK

# 3 Analytical Results and Interpretation

## 3.1 Introduction

All field samples collected were submitted to E & E's Analytical Services Center (ASC) for analysis according to the Work Plan (E & E 2001). Additional samples collected were also submitted to the ASC for analysis. Analytical data is discussed below and summarized in Tables 3-1 through 3-10. Laboratory analytical data reports are presented in Appendix D.

In addition to the primary analytes detected, the analysis also detected 695 tentatively identified compounds (TICs) among the soil samples. These compounds are reported as "unknowns" within various chemical groups. TICs in this set of project data consisted primarily of unknown acids, aromatics, and PAHs. TICs are usually detected in samples collected from areas where compound weathering, or degradation, occurs; degradation processes can result in numerous additional compounds. Also, some TICs are naturally occurring.

TICS are not discussed further in this report. However, they are reported in the data summary reports presented in Appendix E.

## 3.2 Establishment of Comparison Criteria

Many approaches can be used to establish media-specific analyte comparison concentrations to determine if the site concentrations found pose a concern. For example, in New York State, soil sample data is usually compared to NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046 Soil Cleanup Criteria. This approach presents a problem when background soil concentrations exceed TAGM 4046 criteria. Such is the case with the Dussault Foundry site.

One method of addressing this issue is the one provided in EPA Region II's Directive 9285.7-19FS, *Establishing Background Levels* (EPA 1995). This document recommends selecting the highest background concentration detected as the basis of comparison.

A combination of the two approaches mentioned above was selected for use in this report based on this project being conducted in New York State under EPA

oversight. TAGM 4046 criteria were used as the primary basis of comparison. For those few analytes that were present in the background samples in concentrations exceeding TAGM 4046, the highest background concentration was used. Where applicable, these changes are reflected in the data summary tables.

Note that many samples were submitted for both SVOC analysis as well as total phenolics analysis. One of the SVOC analytes is the compound "phenol," which is also a phenolic compound detected by the total phenolic analysis. TAGM 4046 has established cleanup criteria for both phenol as well as for a total phenolic compound concentration. Since the family of phenolic compounds is vast, TAGM 4046 has not established criteria for all phenolic compounds. However, it has established criteria for some, including the compound phenol. When evaluating the need for soil remediation, one must consider both the compound-specific criteria as well as the chemical family criteria to establish a meaningful remediation plan.

## 3.3 Analytical Data Review

All laboratory analytical data was submitted to Data Validations Services, Inc. (DVS) for preparation of a Data Usability Summary Report (DUSR), as per the project Work Plan. The DUSR is presented in Appendix D.

The DUSR concluded that most sample analyte values and reporting limits are usable as reported, with addition of minor qualification to the data set. The bulk of the qualification necessary was the addition of "J" to indicate an estimated value. All correlations between the original and duplicate samples were within validation guidelines except those for iron, chromium, and copper in the sump water samples. These three samples showed a variance exceeding 50 percent of the contract reporting detection limit.

Pesticides data is generated as part of the PCB analysis; however, the Work Plan did not prescribe submittal of samples for pesticide analysis. The pesticide data was not fully reviewed or reported. However, DVS did conduct preliminary review of the pesticide data and noted that most of the reported pesticide detections reflect matrix interference, and they would be edited to nondetection or considered tentative in identification under a full review. Pesticide data is not presented in this report.

Besides not reviewing pesticide compounds, the data review process did not include reviewing unused re-extracted sample data or laboratory internal-check data. Unreviewed data is marked with a line across the portion of the analytical data report listing unreviewed compounds.

## 3.4 Background Soil Data

Three surface soil samples were collected off site to evaluate the background soil concentrations of SVOCs: PCB, metals, and total phenol concentrations. PCBs were not detected in any of these samples.

Nine SVOCs concentrations exceeded TAGM 4046 soil cleanup criteria in at least one sample each: 4-methylnaphthalene; 4-nitroanaline; benz(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; di-benz(a,h)anthracene; and phenol. Most SVOC exceedances ranged up to 10 times the TAGM 4046 value, although the dibenzo(a,h)anthracene concentration in one background sample was estimated at over 100 times the TAGM 4046 value.

Seven metals (arsenic, beryllium, cadmium, chromium, mercury, nickel, and zinc) were all detected at concentrations exceeding TAGM 4046 criteria in at least one background soil sample. Most of the metals exceedance concentrations were two to three times the TAGM 4046 criteria, except for zinc, which was present in concentrations approximately 10 to 16 times higher than the TAGM 4046 criteria.

Table 3-1 summarizes the background soil data. Shaded values indicate an exceedance of the TAGM 4046 criteria.

Given the location of the background samples (adjacent to the base of the hill, below a railroad bed), it is possible that contamination from railroad operations in the form of coal dust or soot has affected the soil. However, since the site is located in a linear position paralleling the rail bed, one would expect the railroad influence to occur along most of the site; not just at the background soil sample area.

Except for phenol, the other eight SVOCs detected are PAHs; a subset of the SVOC group known to result from burning of carbon-containing materials and heating coal-containing materials. Note that at some time in the past, a major fire occurred at the railroad station located on the corner of Union and Washburn Streets, diagonally across from the main site building. Fires are most always PAH sources. The dominant local wind direction is southwest (NMOC 1996); thus airborne PAHs from the fire could have traveled north and settled onto the site at the time of the fire. However, in days subsequent to the fire, a wind direction shift could have easily blown soot into the background area. Thus the entire area, including the background sample area, could have elevated PAH concentrations due to the ambient conditions unrelated to site activities. Thus the background samples are considered to be representative of local soil conditions.

## 3.5 Railroad Area Surface Soil Samples

The four railroad area surface soil samples collected were submitted for SVOC analysis. Twenty-four SVOC compounds, mostly PAHs, were detected among the four samples. Of those 24 compounds, concentrations of nine compounds ex-

ceeded TAGM 4046 criteria in at least one sample each. However, only three compounds were detected at concentrations exceeded the background soil concentrations: dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene at location RR02; and phenol at locations RR01 and RR03. Phenol was also detected in the duplicate sample from RR02, but not in the original sample from that location. This demonstrates the variability in soil conditions present, even in a homogenized soil mixture.

Noteworthy is that all but one of the nine compounds exceeding TAGM 4046 criteria in the railroad area samples are also present in at least one of the background samples at a concentration exceeding TAGM 4046 criteria. Elevated SVOC presence in the railroad area soil samples is expected, as oils, coal, and soot all contain elevated SVOC concentrations.

Table 3-2 summarizes the analytical data findings. Shaded values listed in that table exceed either the TAGM 4046 cleanup criteria or the background soil values.

## 3.6 Molding Sand Samples

Molding sand samples were submitted for SVOC, metals, and total phenols analysis. Only three SVOC analytes were present at concentrations exceeding TAGM 4046 criteria: benzo(a)anthracene, dibenz(a,h)anthracene, and phenol. Note that these same three compounds were also present at concentrations exceeding TAGM 4046 criteria in all three background samples (see Table 3-1). A site-specific background SVOC data comparison showed the only exceedances detected were phenol concentrations in all samples. This is to be expected as the Phase I report (Foit Albert 2000) indicates phenolic resin was added to the molding sand during the foundry process. However, note that none of the samples contained a total phenolics compound concentration in excess of the TAGM 4046 criteria. (See Section 3.1 for a discussion of the difference between SVOC phenol analysis and total phenol analysis.)

Metals analysis of the molding soil samples revealed that beryllium, chromium, copper, iron, nickel, and zinc were present at concentrations exceeding TAGM 4046 criteria in at least one sample each. Site-specific cleanup criteria exceedances consisted of chromium and nickel in all samples; copper in all but the sample from location MS02; and iron in the duplicate sample collected from location MS04. Excessive concentrations of these metals in molding sand is consistent with the former site use. Table 3-3 summarizes the molding sand sample analytical data.

## 3.7 Raceway Samples

Two raceway samples were collected and submitted for VOC, SVOC, PCB, and metals analyses. Two VOCs, methylcyclohexane, and tetrachloroethene, were detected at very low, estimated values of 1 and 6 microgram per kilogram (µg/kg),

respectively. A third compound, trichloroethene, was detected at a concentration of 23 µg/kg; below the TAGM 4046 cleanup criteria of 700 µg/kg.

In addition to the VOCs, 22 SVOCs were detected between samples RW01 and RW02, although only five compounds, benz(a)anthracene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and phenol, were present at concentrations exceeding TAGM 4046 criteria. Only the phenol concentrations of 45 µg/kg and 46 µg/kg, respectively, exceeded the background soil concentration of 30 µg/kg. PCBs were not detected in either raceway soil sample.

Metals analysis revealed beryllium, cadmium, chromium, nickel, and zinc concentrations to exceed TAGM 4046 cleanup criteria in at least one sample each. Comparison to background data values showed the copper, nickel, and zinc concentration exceeded them in sample RW02.

Table 3-4 summarizes the raceway sample data.

## 3.8 Subfloor Soil Samples

Subfloor samples were submitted for various analyses depending on the area from which they were collected. However, due to the prevalence of phenol-containing sand, all subfloor samples were submitted for total phenols analysis. While total phenols were found in every sample except the sample from location 6 (the oven area, along the south wall), none of the total phenol concentrations exceeded the TAGM 4046 criteria.

Subfloor sample DF-Sub3-SO and its duplicate, collected in the machine shop area, were the only samples submitted for VOC analysis. Both were found to contain acetone at estimated concentrations of 52 µg/kg and 37 µg/kg, respectively. Neither compound was present in a concentration exceeding TAGM 4046. Sub03 also contains carbon disulfide at an estimated concentration of 1 µg/kg. Toluene was detected at an estimated concentration of 1 µg/kg in the duplicate sample of Sub03. Neither of these latter two findings is considered significant due to the extremely small concentrations and the estimated nature of the concentrations.

None of the subfloor samples were submitted for SVOC analysis. Samples Sub03 and Sub07 were submitted for PCB analysis. PCBs were not detected in Sub03; sample DF-Sub7-SO contained an estimated PCB concentration of 33 µg/kg. PCB presence in the subfloor soil indicates PCBs may have been used in the vicinity, and entered through a fracture in the floor.

Samples Sub02, Sub03, Sub04, Sub07, and Sub08 were each submitted for TAL metals analysis. Beryllium and copper concentrations exceeded NYSDEC TAGM 4046 cleanup goals in samples from location 3,4,7, and 8 (see Figure 2-1). Copper was the only metal present in concentrations exceeding site background concentrations; exceedances were detected in samples Sub02, Sub03, Sub07, and

Sub08. Mercury concentrations in samples Sub07 and Sub08 also exceeded the TAGM 4046 cleanup goal as well as the site background concentration. Elevated copper presence is consistent with the nature of the foundry operations. However, an explanation for the elevated mercury presence is not immediately obvious, based on available site history.

Table 3-5 summarizes the subfloor soil data.

## 3.9 Additional Surface Soil Samples

Two surface soil samples were collected to evaluate possible PCB presence. Sample DF-SS01-SO was collected at the northeast perimeter of the concrete pad of the electrical substation where at least one transformer is believed to have been located. The northeast corner was selected because it had iron staining, indicating that it was the area to which runoff would flow. Sample DF-SS02-SO was collected from the foundry sand pile in the area of the electrical control room inside the building.

PCBs were not detected in either soil sample. Table 3-6 summarizes the analytical findings of these samples.

## 3.10 Pit/Sump Water and Sediment Sampling

### 3.10.1 Water Sampling

One water sample was collected from each of four pits/sumps to determine if they contained hazardous materials. Each sample was submitted for VOC, PCB, total phenols, and metals analyses.

VOC analysis detected acetone samples from sump 1, sump 2, sump 4, and the duplicate sample from sump 1; concentrations ranged from 15 micrograms per liter (µg/L) to 18 µg/L. PCBs were not detected in any of the sump samples.

Total phenolics analysis detected phenols in the water from the original and duplicate sample from sump 1 at concentrations of 0.137 µg/L and 0.232 µg/L, respectively. A lower concentration, 0.0151 µg/L, was detected in sump 3.

Table 3-7 summarizes the sump water sample analytical data. Note that there are no comparisons to any cleanup criteria due to the fact that the water is in enclosed pits; it fits neither the definition of groundwater nor of surface water. Disposal of this water will likely require comparison of this data to the waste water quality criteria of nearby water treatment plants and hazardous waste treatment plants to determine if one such facility can accept the waste water without pretreatment.

In addition to laboratory analyses, the pH of each sump water sample was read in the field. Table 3-8 reports the sump water pH values recorded.

### 3.10.2 Sump Sediment Sampling

In addition to the water samples, one sediment sample consisting of a dark sludge was collected from sump 3, which is located around the base of an electrical control panel room. This dark sludge, and one duplicate sample, were submitted for PCB and SVOC analyses. PCB analysis showed both the original and duplicate samples to contain PCB at concentrations of 440 µg/kg and 260 µg/kg, respectively. Note that this concentration is less than the 1 part per million (1,000 µg/kg) cleanup guidance set forth by TAGM 4046.

SVOC analysis of the sludge detected the presence of seven SVOCs. All compound concentrations were estimated except for that of bis(2-ethylhexyl)phthalate, which was detected at concentrations of 37,000 µg/kg and 31,000 µg/kg in the original and duplicate sample, respectively.

Phenol was detected at concentrations of 2,500 and 1,800 µg/kg, respectively, in the original and duplicate samples. Specific regulatory criteria do not exist for compounds in sludge or sediment contained in a secure area; various regulatory criteria may apply depending on how the sludge is managed.

Table 3-9 summarizes the sump sediment sample data.

## 3.11 Underground Storage Tank Soil Sampling

One original and one duplicate soil sample were collected from below the IPA tank located near the midpoint of the southern wall of the main building. These samples were submitted for both VOC and IPA analyses. IPA was detected at estimated concentrations of 5,400 µg/kg and 970 µg/kg in the original and duplicate samples, respectively. However, acetone was detected estimated concentrations of 110,000 µg/kg and 65,000 µg/kg in the original and duplicate samples, respectively. These concentrations exceed the TAGM 4046 soil cleanup criteria of 1.1 µg/kg.

The analysis was conducted using a gas chromatograph/mass spectrometer (GC/MS). IPA and acetone elute from the gas chromatograph (GC) column at very similar times. High concentrations of one can mask the presence of the other. In the case of above-noted data, the closeness of the ion masses (IPA is 45 and acetone is 43), and the similar retention time, cause difficulties in peak separation and integration. That affects final compound quantitation. This mutual compound interference problem results in the possibility that a slightly higher IPA concentration is present than what was recorded.

Note also that the IPA concentration is estimated. This results from a lack of using a compound-specific reference standard under the analytical method.

Note that acetone is not a naturally occurring analyte, as is the case with metals. Acetone can form from the reaction of IPA and an acid. Also, one method of manufacturing acetone uses IPA as a primary component. Thus both the IPA and

the acetone concentrations detected in the soil underneath the tank indicate a release of its contents has occurred.

Table 3-1
Analytical Data Summary of Background Surface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 | Sample ID: / Date: | DF-BK01-SO 12/05/01 | DF-BK02-SO 12/05/01 | DF-BK03-SO 12/05/01 | Background Comparison Value Used in Place of TAGM 4046 (If Applicable) |
|---|---|---|---|---|---|---|
| CLP Mercury Analysis by Method ILM04.0 (mg/Kg) | | | | | | |
| Mercury | 0.1 | | 0.70 NJ | 0.28 NJ | 0.61 NJ | 0.7 |
| DEC ASP SVOCs by Method OLM04.2 (µg/Kg) | | | | | | |
| 1,1'-Biphenyl | NA | | ND | ND | ND | |
| 2-Methylnaphthalene | 36400 | | 87 J | 140 J | ND | |
| 4-Methylphenol | 100 | | ND | ND | 320 J | 320 |
| 4-Nitroaniline | 430 | | ND | 750 J | ND | 750 |
| Acenaphthene | 50000 | | 190 J | ND | ND | |
| Acenaphthylene | 41000 | | 1000 | 770 | 7000 | 7000 |
| Acetophenone | NA | | 76 J | 86 J | ND | |
| Anthracene | 50000 | | 1000 | 540 | 5500 | |
| Benz(a)anthracene | 224 | | 1700 | 1000 | 8100 | 8100 |
| Benzaldehyde | NA | | ND | 49 NJ | ND | |
| Benzo(a)pyrene | 61 | | 1600 J | 1000 J | 7800 J | 7800 |
| Benzo(b)fluoranthene | 1100 | | 1800 J | 1100 J | 6700 J | 9600 |
| Benzo(g,h,i)perylene | 50000 | | 470 J | 250 J | 1600 J | |
| Benzo(k)fluoranthene | 1100 | | 1400 J | 1100 J | 7800 J | 7800 |
| Bis(2-ethylhexyl)phthalate | 50000 | | ND | ND | ND | |
| Butyl benzyl phthalate | 50000 | | 48 J | ND | ND | |
| Carbazole | NA | | 460 | 190 J | 1200 J | |
| Chrysene | 400 | | 2100 | 1300 | 8200 | 8200 |
| Dibenz(a,h)anthracene | 14 | | 350 J | 200 J | 1600 J | 1600 |
| Dibenzofuran | 6200 | | 150 J | 58 J | ND | |
| Di-n-butyl phthalate | 8100 | | ND | ND | ND | |
| Fluoranthene | 50000 | | 3200 J | 1900 | 9500 | |
| Fluorene | 50000 | | 210 J | ND | ND | |
| Indeno(1,2,3-cd)pyrene | 3200 | | 790 J | 470 J | 3200 J | |
| Naphthalene | 13000 | | 77 J | 81 J | ND | |
| Phenanthrene | 50000 | | 2400 | 730 | 750 J | |
| Phenol | 30 | | ND | 44 J | ND | 44 |
| Pyrene | 50000 | | 2000 | 1100 | 8600 | |

Source: Ecology and Environment, Inc., 2000

Table 3-1
Analytical Data Summary of Background Surface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 | Sample ID: / Date: | DF-BK01-SO 12/05/01 | DF-BK02-SO 12/05/01 | DF-BK03-SO 12/05/01 | Background Comparison Value Used in Place of TAGM 4046 (if Applicable) |
|---|---|---|---|---|---|---|
| TAL Metals by Method ILM04.2 (mg/Kg) | | | | | | |
| Aluminum | NA | | 3760 | 3980 | 3160 | |
| Antimony | NA | | 0.48 UJ | 0.61 J | 0.84 J | |
| Arsenic | 7.5 | | 5.1 | 17.8 | 7.3 | 17.8 |
| Barium | 300 | | 50.4 | 60.8 | 47.0 J | |
| Beryllium | 0.16 | | 0.51 J | 0.56 J | 0.38 J | 0.56 |
| Cadmium | 1 | | 0.88 J | 1.2 J | 1.6 | 1.6 |
| Calcium | NA | | 43200 | 54700 | 73200 | |
| Chromium | 10 | | 9.6 | 11.4 | 22.3 | 22.3 |
| Cobalt | 30 | | 4.8 J | 5.4 J | 4.7 J | |
| Copper | 25 | | 49.9 UJ | 36.5 UJ | 47.1 UJ | |
| Iron | 20000 | | 11200 | 14300 | 14500 | |
| Lead | NA | | 79.2 | 76.5 | 121 | |
| Magnesium | NA | | 21100 | 29000 | 40600 | |
| Manganese | NA | | 557 J | 536 J | 564 J | |
| Nickel | 13 | | 14.6 | 17.8 | 28 | 28 |
| Potassium | NA | | 793 J | 896 J | 757 J | |
| Selenium | 2 | | 1.0 J | 1.8 J | 1.1 J | |
| Silver | NA | | 0.11 J | 0.14 J | 0.13 J | |
| Sodium | NA | | 87.5 J | 123 J | 138 J | |
| Vanadium | 150 | | 9.9 J | 12.1 J | 10.1 J | |
| Zinc | 20 | | 187 | 194 | 326 | 326 |

Key:

J = Estimated value.

ND = Not detected at the reported value.

NJ = Tentative Compound Identification at an Estimated Concentration

UJ = Not Detected; concentration is estim

µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-2
Analytical Data Summary of Railroad Area Surface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 or Background Value | Sample ID: / Date: | DF-RR01-SO 12/04/01 | DF-RR02-SD 12/04/01 | DF-RR02-SO 12/04/01 | DF-RR03-SO 12/04/01 | DF-RR04-SO 12/04/01 |
|---|---|---|---|---|---|---|---|
| DEC ASP SVOCs by Method OLM04.2 (µg/Kg) | | | | | | | |
| 1,1'-Biphenyl | NA | | 59 J | ND | ND | 270 J | 44 J |
| 2-Methylnaphthalene | 36400 | | 260 J | 310 J | 260 J | 420 J | 200 J |
| 4-Methylphenol | 320 | | ND | ND | ND | 110 J | ND |
| 4-Nitroaniline | 750 | | ND | ND | ND | ND | ND |
| Acenaphthene | 50000 | | ND | ND | ND | ND | ND |
| Acenaphthylene | 41000 | | 120 J | 5900 | 4700 | ND | ND |
| Acetophenone | NA | | 91 J | 210 J | ND | 140 J | 51 J |
| Anthracene | 50000 | | 80 J | 3200 | 2600 | 81 J | ND |
| Benz(a)anthracene | 8100 | | 280 J | 6900 | 5900 | ND | 110 J |
| Benzaldehyde | NA | | 49 J | ND | ND | 230 J | 54 J |
| Benzo(a)pyrene | 7800 | | 260 J | 5900 J | 5100 J | ND | 85 J |
| Benzo(b)fluoranthene | 9600 | | 290 J | 7000 J | 4400 J | ND | 130 J |
| Benzo(g,h,i)perylene | 50000 | | 200 J | 1600 J | 2300 J | ND | 72 J |
| Benzo(k)fluoranthene | 7800 | | 240 J | 5300 J | 5200 J | ND | 91 J |
| Bis(2-ethylhexyl)phthalate | 50000 | | ND | ND | ND | ND | ND |
| Butyl benzyl phthalate | 50000 | | 40 J | ND | ND | ND | ND |
| Carbazole | NA | | 43 J | 630 J | 500 J | ND | ND |
| Chrysene | 8200 | | 400 | 7300 | 6200 | ND | 140 J |
| Dibenz(a,h)anthracene | 1600 | | 100 J | 1400 J | 1800 J | ND | 39 J |
| Dibenzofuran | 6200 | | 72 J | ND | ND | 280 J | 67 J |
| Di-n-butyl phthalate | 8100 | | ND | 1100 J | ND | 58 J | ND |
| Fluoranthene | 50000 | | 530 | 6700 | 6300 | 74 J | 200 J |
| Fluorene | 50000 | | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | 3200 | | 260 J | 2900 J | 4000 J | ND | 84 J |
| Naphthalene | 13000 | | 250 J | 270 J | 260 J | 1100 | 210 J |
| Phenanthrene | 50000 | | 340 J | 1300 J | 1200 J | 270 J | 190 J |
| Phenol | 44 | | 73 J | 230 J | ND | 200 J | 41 J |
| Pyrene | 50000 | | 460 | 5400 | 5900 | ND | 180 J |

Key:

J = Estimated value.

ND = Not detected at the reported value.

µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-3
Analytical Data Summary of Molding Sand Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 or Background Value | | Sample ID: | DF-MS01-SO | DF-MS02-SO | DF-MS03-SO | DF-MS04-SD | DF-MS04-SO |
|---|---|---|---|---|---|---|---|---|
| | | | Date: | 12/05/01 | 12/04/01 | 12/04/01 | 12/04/01 | 12/04/01 |
| **CLP Mercury Analysis by Method ILM04.0 (mg/Kg)** | | | | | | | | |
| Mercury | 0.1 | | | 0.042 J | 0.053 J | 0.042 J | 0.046 J | 0.049 |
| **DEC ASP SVOCs by Method OLM04.2 (µg/Kg)** | | | | | | | | |
| 1,1'-Biphenyl | NA | | | 59 J | 47 J | 74 J | 38 J | 39 J |
| 2-Methylnaphthalene | 36400 | | | 180 J | 210 J | 69 J | 110 J | 110 J |
| 4-Methylphenol | 320 | | | ND | ND | 41 J | ND | ND |
| 4-Nitroaniline | 750 | | | ND | ND | ND | ND | ND |
| Acenaphthene | 50000 | | | ND | ND | ND | ND | ND |
| Acenaphthylene | 41000 | | | ND | ND | ND | 94 J | 140 J |
| Acetophenone | NA | | | 65 J | 66 J | 81 J | 54 J | 53 J |
| Anthracene | 50000 | | | ND | ND | 50 J | 92 J | 110 J |
| Benz(a)anthracene | 8100 | | | 38 J | 38 J | 110 J | 220 J | 190 J |
| Benzaldehyde | NA | | | 47 J | 55 J | 49 J | ND | ND |
| Benzo(a)pyrene | 7800 | | | ND | ND | 85 J | 170 J | 170 J |
| Benzo(b)fluoranthene | 9600 | | | 36 J | ND | 100 J | 160 J | 180 J |
| Benzo(g,h,i)perylene | 50000 | | | 40 J | ND | 61 J | 120 J | 87 J |
| Benzo(k)fluoranthene | 7800 | | | 40 J | ND | 70 J | 160 J | 180 J |
| Bis(2-ethylhexyl)phthalate | 50000 | | | ND | ND | ND | ND | ND |
| Butyl benzyl phthalate | 50000 | | | 44 J | 64 J | 73 J | 59 J | 44 J |
| Carbazole | NA | | | ND | ND | ND | ND | ND |
| Chrysene | 8200 | | | 59 J | 53 J | 150 J | 240 J | 250 J |
| Dibenz(a,h)anthracene | 1600 | | | ND | ND | 39 J | 68 J | 49 J |
| Dibenzofuran | 6200 | | | 41 J | 65 J | 45 J | 50 J | 43 J |
| Di-n-butyl phthalate | 8100 | | | ND | ND | ND | ND | ND |
| Fluoranthene | 50000 | | | 61 J | 70 J | 270 J | 420 | 390 |
| Fluorene | 50000 | | | ND | ND | ND | 37 J | ND |
| Indeno(1,2,3-cd)pyrene | 3200 | | | ND | ND | 78 J | 170 J | 110 J |
| Naphthalene | 13000 | | | 150 J | 220 J | 150 J | 120 J | 100 J |
| Phenanthrene | 50000 | | | 130 J | 140 J | 270 J | 320 J | 220 J |
| Phenol | 44 | | | 38 J | 58 J | 2900 J | 84 J | 57 J |
| Pyrene | 50000 | | | 62 J | 68 J | 160 J | 340 J | 200 J |

Source: Ecology and Environment, Inc., 2000

Table 3-3
Analytical Data Summary of Molding Sand Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 or Background Value | Sample ID: / Date: | DF-MS01-SO 12/05/01 | DF-MS02-SO 12/04/01 | DF-MS03-SO 12/04/01 | DF-MS04-SD 12/04/01 | DF-MS04-SO 12/04/01 |
|---|---|---|---|---|---|---|---|
| **Total Phenols (mg/kg)** | | | | | | | |
| Phenolics, Total | 30 | | 0.685 | 1.11 | - 5.09 | 0.653 | 1 |
| **TAL Metals by Method ILM04.2 (mg/Kg)** | | | | | | | |
| Aluminum | NA | | 990 | 730 | 1790 | 1960 | 3640 |
| Antimony | NA | | 0.94 J | 0.66 J | 0.79 J | 1.1 J | 0.53 J |
| Arsenic | 17.8 | | 2.5 | 1.8 J | 2.5 | 3.6 | 3.5 |
| Barium | 300 | | 24.2 J | 97.7 | 40.8 J | 107 | 116 |
| Beryllium | 0.56 | | 0.20 J | ND | 0.14 J | 0.16 J | 0.36 J |
| Cadmium | 1.6 | | 0.49 J | 0.39 J | 0.48 J | 0.84 J | 0.53 J |
| Calcium | NA | | 1030 J | 1730 | 13500 | 7360 | 8200 |
| Chromium | 22.3 | | 32.8 | 45.5 | 23.7 | 43 | 20.3 |
| Cobalt | 30 | | 4.8 J | 2.1 J | 4.0 J | 5.3 J | 4.4 J |
| Copper | 25 | | 68.8 J | 48.0 UJ | 199 J | 133 J | 75.4 J |
| Iron | 20000 | | 29100 | 19500 | 18700 | 39000 | 19600 |
| Lead | NA | | 21.7 | 10.2 | 59.2 | 41.6 | 34.7 |
| Magnesium | NA | | 631 J | 614 J | 6390 | 2860 | 3630 |
| Manganese | NA | | 268 J | 176 J | 200 J | 353 J | 364 J |
| Nickel | 28 | | 37.7 | 25.4 | 32.9 | 45.9 | 39.5 |
| Potassium | NA | | 97.1 J | 117 J | 230 J | 375 J | 557 J |
| Selenium | 2 | | 0.80 J | ND | 0.61 J | 0.96 J | 0.68 J |
| Silver | NA | | 0.074 J | 0.094 J | 0.15 J | 0.16 J | 0.096 J |
| Sodium | NA | | 46.9 J | 136 J | 79.9 J | 116 J | 117 J |
| Vanadium | 150 | | 4.6 J | 4.3 J | 5.1 J | 7.2 J | 8.5 J |
| Zinc | 326 | | 31.6 | 34.1 | 85.6 | 63.8 | 72.5 |

Key:

J = Estimated value.

ND = Not detected at the reported value.

µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-4
Analytical Data Summary of Raceway Surface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 or Background Value | Sample ID: / Date: | DF-RW01-SO 12/05/01 | DF-RW02-SO 12/04/01 |
|---|---|---|---|---|
| CLP Mercury Analysis by Method ILM04.0 (mg/Kg) | | | | |
| Mercury | 0.1 | | 0.13 J | 0.073 NJ |
| DEC ASP SVOCs by Method OLM04.2 (µg/Kg) | | | | |
| 1,1'-Biphenyl | NA | | 84 J | 62 J |
| 2-Methylnaphthalene | 36400 | | 280 J | 360 J |
| 4-Methylphenol | 320 | | ND | 39 J |
| 4-Nitroaniline | 750 | | ND | ND |
| Acenaphthene | 50000 | | ND | ND |
| Acenaphthylene | 41000 | | 210 J | 400 |
| Acetophenone | NA | | 56 J | 92 J |
| Anthracene | 50000 | | 160 J | 290 J |
| Benz(a)anthracene | 8100 | | 370 J | 890 |
| Benzaldehyde | NA | | ND | 74 J |
| Benzo(a)pyrene | 7800 | | 340 J | 870 J |
| Benzo(b)fluoranthene | 9600 | | 320 J | 1100 J |
| Benzo(g,h,i)perylene | 50000 | | 190 J | 320 J |
| Benzo(k)fluoranthene | 7800 | | 310 J | 970 J |
| Bis(2-ethylhexyl)phthalate | 50000 | | ND | ND |
| Butyl benzyl phthalate | 50000 | | ND | ND |
| Carbazole | NA | | 66 J | 85 J |
| Chrysene | 8200 | | 440 | 1100 |
| Dibenz(a,h)anthracene | 1600 | | 100 J | 190 J |
| Dibenzofuran | 6200 | | 80 J | 81 J |
| Di-n-butyl phthalate | 8100 | | ND | ND |
| Fluoranthene | 50000 | | 610 | 1300 |
| Fluorene | 50000 | | ND | ND |
| Indeno(1,2,3-cd)pyrene | 3200 | | 270 J | 470 J |
| Naphthalene | 13000 | | 190 J | 280 J |
| Phenanthrene | 50000 | | 440 | 400 |
| Phenol | 44 | | 45 J | 46 J |
| Pyrene | 50000 | | 450 | 760 |
| DEC ASP VOCs by Method OLM04.2 (µg/Kg) | | | | |
| Methylcyclohexane | NA | | 1 J | ND |
| Tetrachloroethene | 1400 | | 6 J | ND |
| Trichloroethene | 700 | | 23 | ND |

Source: Ecology and Environment, Inc., 2000

Table 3-4
Analytical Data Summary of Raceway Surface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 or Background Value | Sample ID: / Date: | DF-RW01-SO 12/05/01 | DF-RW02-SO 12/04/01 |
|---|---|---|---|---|
| TAL Metals by Method ILM04.2 (mg/Kg) | | | | |
| Aluminum | NA | | 3540 | 2410 |
| Antimony | NA | | 0.59 J | 0.47 J |
| Arsenic | 17.8 | | 6 | 2.6 |
| Barium | 300 | | 42.4 J | 36.9 J |
| Beryllium | 0.56 | | 0.45 J | 0.24 J |
| Cadmium | 1.6 | | ND | 1.1 J |
| Calcium | NA | | 55000 | 6820 |
| Chromium | 22.3 | | 13.4 | 8.5 |
| Cobalt | 30 | | 5.9 J | 9.6 J |
| Copper | 25 | | 39.5 UJ | 70.8 J |
| Iron | 20000 | | 13400 | 13000 |
| Lead | NA | | 69.5 | 59.7 |
| Magnesium | NA | | 8700 | 1580 |
| Manganese | NA | | 357 J | 1230 J |
| Nickel | 28 | | 18 | 38.1 |
| Potassium | NA | | 1200 J | 258 J |
| Selenium | 2 | | 0.64 J | 1.1 J |
| Silver | NA | | 0.22 J | 0.084 J |
| Sodium | NA | | 123 J | 189 J |
| Vanadium | 150 | | 8.1 J | 6.3 J |
| Zinc | 326 | | 83.6 | 2630 |

Key:

J = Estimated value.

ND = Not detected at the reported value.

NJ = Tentative compound identification at an estimated concentration.

µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-5
Analytical Data Summary Subfloor Soil Samples, Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 Soil Cleanup Criteria | Sample ID: / Date: | DF-SUB01-SO 12/05/01 | DF-SUB02-SO 12/05/01 | DF-SUB03-SD 12/05/01 | DF-SUB03-SO 12/05/01 | DF-SUB04-SO 12/05/01 | DF-SUB05-SO 12/05/01 |
|---|---|---|---|---|---|---|---|---|
| DEC ASP VOCs by Method OLM04.2 (µg/Kg) | | | | | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 6000 | | NA | NA | 37 | 52 | NA | ND |
| Acetone | 200 | | NA | NA | 37 J | 52 J | NA | ND |
| Carbon disulfide | 2700 | | NA | NA | ND | 1 J | NA | ND |
| Toluene | 1500 | | NA | NA | 1 J | ND | NA | ND |
| Total Phenols (mg/kg) | | | | | | | | |
| Phenolics, Total | 30 | | ND | 0.862 | 1.09 | 1.67 | 1.44 | ND |
| TAL Metals by Method ILM04.2 (mg/Kg) | | | | | | | | |
| Aluminum | NA | | NA | 1490 | 1510 | 1330 | 1660 | NA |
| Antimony | NA | | NA | 3.4 J | 1.1 J | 0.65 J | 0.89 J | NA |
| Arsenic | 7.5 | | NA | 12.1 | 5.3 | 1.3 J | 1.7 J | NA |
| Barium | 300 | | NA | 26.1 J | 28.2 J | 18.1 J | 17.9 J | NA |
| Beryllium | 0.16 | | NA | 0.13 J | 0.17 J | 0.14 J | 0.17 J | NA |
| Cadmium | 1 | | NA | 0.89 | 0.87 J | 0.44 J | 0.28 J | NA |
| Calcium | NA | | NA | 11400 | 16800 | 11600 | 45900 | NA |
| Chromium | 10 | | NA | 11 | 107 | 18.6 | 7 | NA |
| Cobalt | 30 | | NA | 3.8 | 11.4 | 3.7 J | 3.1 J | NA |
| Copper | 25 | | NA | 58.7 J | 102 J | 22.8 J | 16.0 J | NA |
| Iron | 2000 | | NA | 12400 | 39600 | 19600 | 5980 | NA |
| Lead | NA | | NA | 36.3 | 31 | 27.4 | 19.1 | NA |
| Magnesium | NA | | NA | 1700 | 3150 | 1490 | 7450 | NA |
| Manganese | NA | | NA | 148 | 488 J | 280 J | 158 J | NA |
| Nickel | 13 | | NA | 14.5 | 128 | 49 | 6.7 J | NA |
| Potassium | NA | | NA | 516 | 307 J | 268 J | 298 J | NA |
| Selenium | 2 | | NA | ND | 0.90 J | 0.59 J | ND | NA |
| Silver | NA | | NA | 0.18 J | 0.085 J | 0.18 J | 0.079 J | NA |
| Sodium | NA | | NA | 152 | 86.5 J | 92.3 J | 131 J | NA |
| Vanadium | 150 | | NA | ND | 5.8 J | 3.8 J | 4.1 J | NA |
| Zinc | 20 | | NA | 240 | 57.4 | 50.1 | 42.9 | NA |
| CLP Mercury Analysis by Method ILM04.0 (mg/Kg) | | | | | | | | |
| Mercury | 0.1 | | NA | NA | 0.0909 NJ | 0.055 NJ | 0.048 NJ | NA |

Key:
J = Estimated value.
ND = Not detected at the reported value.
µg/Kg = Micrograms per kilogram.

Note:
Shaded cells exceed 1000 ppb. All screening values are calculated based on TOC.

Source: Ecology and Environment, Inc., 2000

Table 3-5
Analytical Data Summary Subfloor Soil Samples, Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 Soil Cleanup Criteria | Sample ID: / Date: | DF-SUB06-SO 12/05/01 | DF-SUB07-SO 12/05/01 | DF-SUB08-SO 12/05/01 | DF-SUB09-SO 12/05/01 | DF-SUB10-SO 12/05/01 |
|---|---|---|---|---|---|---|---|
| DEC ASP VOCs by Method OLM04.2 (µg/Kg) | | | | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 6000 | | NA | NA | NA | NA | NA |
| Acetone | 200 | | NA | NA | NA | NA | NA |
| Carbon disulfide | 2700 | | NA | NA | NA | NA | NA |
| Toluene | 1500 | | NA | NA | NA | NA | NA |
| Total Phenols (mg/kg) | | | | | | | |
| Phenolics, Total | 30 | | ND | 2.68 | 0.867 | 0.865 | 2.03 |
| TAL Metals by Method ILM04.2 (mg/Kg) | | | | | | | |
| Aluminum | NA | | NA | 3430 | 5550 | NA | NA |
| Antimony | NA | | NA | ND | 1.1 J | NA | NA |
| Arsenic | 7.5 | | NA | 3.9 | 8.6 | NA | NA |
| Barium | 300 | | NA | 36.4 J | 46.4 J | NA | NA |
| Beryllium | 0.16 | | NA | 0.32 J | 0.53 J | NA | NA |
| Cadmium | 1 | | NA | 0.87 J | 0.70 J | NA | NA |
| Calcium | NA | | NA | 109000 | 33000 | NA | NA |
| Chromium | 10 | | NA | 23.2 | 12.1 | NA | NA |
| Cobalt | 30 | | NA | 3.0 J | 4.6 J | NA | NA |
| Copper | 25 | | NA | 31.4 J | 44.9 J | NA | NA |
| Iron | 2000 | | NA | 16500 | 17600 | NA | NA |
| Lead | NA | | NA | 38.7 | 120 | NA | NA |
| Magnesium | NA | | NA | 31500 | 9270 | NA | NA |
| Manganese | NA | | NA | 434 J | 391 J | NA | NA |
| Nickel | 13 | | NA | 17.1 | 15.9 | NA | NA |
| Potassium | NA | | NA | 601 J | 775 J | NA | NA |
| Selenium | 2 | | NA | ND | 1.0 J | NA | NA |
| Silver | NA | | NA | 0.15 J | 0.082 J | NA | NA |
| Sodium | NA | | NA | 198 J | 168 J | NA | NA |
| Vanadium | 150 | | NA | 11.1 J | 13.8 | NA | NA |
| Zinc | 20 | | NA | 87.7 | 102 | NA | NA |
| CLP Mercury Analysis by Method ILM04.0 (mg/Kg) | | | | | | | |
| Mercury | 0.1 | | NA | 0.21 NJ | 0.37 NJ | NA | NA |

Key:
J = Estimated value.
ND = Not detected at the reported value.
µg/Kg = Micrograms per kilogram.

Note:
Shaded cells exceed 1000 ppb. All screening values are calculated based on TOC.

Source: Ecology and Environment, Inc., 2000

Table 3-6
Analytical Data Summary of Miscellaneous Surface Soil Samples;
Dussault Foundry Site, Lockport, New York

| Analyte | NYSDEC TAGM 4046 | | Sample ID: DF-SS01-SO | DF-SS02-SO |
|---|---|---|---|---|
| | | Date: | 12/05/01 | 12/05/01 |
| DEC ASP Pesticide/PCB by Method OLM04.2 (µg/Kg) | | | | |
| Aroclor 1242 | 1,000 | | ND | ND |

Key:

ND = Not detected at the reported value.
µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-7
Analytical Data Summary of Sump Water Samples; Dussault Foundry Site, Lockport, New York

| Analyte | Sample ID: | DF-SUMP1-WD | DF-SUMP1-WO | DF-SUMP2-WO | DF-SUMP3-WO | DF-SUMP4-WO |
|---|---|---|---|---|---|---|
| | Date: | 12/04/01 | 12/04/01 | 12/04/01 | 12/04/01 | 12/04/01 |
| **DEC ASP VOCs by Method OLM04.2 (µg/L)** | | | | | | |
| Acetone | | 17 | 15 | 18 | ND | 17 |
| **Total Phenols (mg/L)** | | | | | | |
| Phenolics, Total | | 0.232 | 0.137 | ND | 0.0151 | ND |
| **TAL Metals by Method ILM04.2 (mg/L)** | | | | | | |
| Aluminum | | 251 | 312 | 449 | 138 J | 113 J |
| Antimony | | 8.3 J | 7.2 J | ND | ND | ND |
| Arsenic | | 1.9 J | 2.6 J | 1.9 J | ND | ND |
| Barium | | 88.6 J | 114 J | 107 J | 57.7 J | 113 J |
| Cadmium | | 1.4 J | 5.7 | 2.0 J | 9.3 | 0.38 J |
| Calcium | | 72800 | 72700 | 148000 | 91900 | 12500 |
| Chromium | | 7.7 J | 37.4 | 8.0 J | 5.3 J | 8.5 J |
| Cobalt | | 1.8 J | 6.8 J | 2.5 J | 1.5 J | 0.93 J |
| Copper | | 24.4 J | 83.2 | 2.5 J | 20.4 J | 16.4 J |
| Iron | | 19100 | 63300 | 32.2 | 7130 | 6460 |
| Lead | | 20.7 | 30 | 129 | 60.3 | 6 |
| Magnesium | | 21800 | 21600 | 19200 | 24500 | 3230 J |
| Manganese | | 586 | 809 | 549 | 617 | 73.8 |
| Nickel | | 4.9 J | 30.8 J | 11.3 J | 18.7 J | 11.7 J |
| Potassium | | 28900 J | 28300 J | 6180 J | 10800 J | 2700 J |
| Selenium | | 4.1 J | 3.6 J | 2.2 J | 2.1 J | ND |
| Silver | | 0.43 J | ND | 0.41 J | 0.49 J | ND |
| Sodium | | 27100 | 26500 | 8480 | 14300 | 1100 J |
| Thallium | | 5.5 J | 4.3 J | 5.7 J | 3.9 J | 3.4 J |
| Vanadium | | 1.3 J | 3.3 J | 2.6 J | 1.5 J | 0.94 J |
| Zinc | | 495 | 748 | 550 | 289 | 144 |

Key:

J = Estimated value.

ND = Not detected at the reported value.

Source: Ecology and Environment, Inc., 2000

Table 3-8 Sump Water pH;
Dussault Foundry Site,
Lockport, New York

| | |
|---|---|
| Sump 1 | 7.28 |
| Sump 2 | 7.18 |
| Sump 3 | 7.39 |
| Sump 4 | 7.21 |

Table 3-9
Analytical Data Summary of Sump Sediment Samples; Dussault Foundry Site, Lockport, New York

| Analyte | Sample ID: | | DF-SED01-DD | DF-SED01-DO |
|---|---|---|---|---|
| | Date: | | 12/05/01 | 12/05/01 |
| DEC ASP PCB by Method OLM04.2 (µg/Kg) | | | | |
| Aroclor 1242 | | | 440 J | 260 J |
| DEC ASP SVOCs by Method OLM04.2 (µg/Kg) | | | | |
| 2,4-Dimethylphenol | | | 4700 J | 5300 J |
| Acetophenone | | | 1500 J | ND |
| Bis(2-ethylhexyl)phthalate | | | 31000 | 37000 |
| Butyl benzyl phthalate | | | 3600 J | 2700 J |
| Phenanthrene | | | 2600 J | 2200 J |
| Phenol | | | 2500 J | 1800 J |
| Pyrene | | | 1800 J | ND |
| Percent Moisture | | | 46.5 | 42.1 |

Key:

J = Estimated value.

ND = Not detected at the reported value.

µg/Kg = Micrograms per kilogram.

Source: Ecology and Environment, Inc., 2000

Table 3-10
Analytical Data Summary of Isopropyl Alcohol UST Subsurface Soil Samples; Dussault Foundry Site, Lockport, New York

| Analyte | Sample ID: | DF-AST1-SO | DF-AST1-SD |
|---|---|---|---|
| | Date: | 12/04/01 | 12/04/01 |
| DEC ASP VOCs by Method OLM04.2 (µg/Kg) | | | |
| Isopropyl Alcohol | | 5400 NJ | 970 NJ |
| Acetone | | 110000 J | 65000 J |

Key:

J = Estimated value.

µg/Kg = Micrograms per kilogram.

N = Detection limit is tentatively identified



Source: Ecology and Environment, Inc., 2000

# 4 Conclusions and Recommendations

## 4.1 Conclusions

Several conclusions can be drawn based on the investigation findings. Each is listed below.

### 4.1.1 General Conclusions

- The geophysical survey and trench excavation activities together indicate that there are no underground storage tanks south of the ASTs located along the south side of the building.

- Field observations, field organic vapor concentration readings at the soil beneath the UST, and analytical data from analysis of soil samples collected beneath the UST collectively demonstrate that the UST either is leaking or has leaked in the past. Soil below the IPA tank contains acetone at concentrations ranging from 110,000 µg/kg and 65,000 µg/kg as well as IPA at concentrations up to 5,400 µg/kg. As of the writing of this report, it is not known whether the tank contains any product.

- Approximately 10,500 cubic yards of molding sand exist on site; 8,700 cubic yards in the western area; 400 cubic yards in distinct piles on the eastern side; 550 cubic yards along the eastern embankment; and 850 cubic yards along the northern hillside. Note that these volumes are purely estimates based on use of a tape measure in the field. A topographic site survey, which would include much more exact measurement data, was not conducted under this investigation. This total sand volume estimate of 10,500 cubic yards coincides well with 10,000 cubic yard estimate stated in the 1989 Phase I report.

- A total of 243 drums were identified on site during the initial and supplemental drum inventories (December 5, 2001, and June 3, 2002). This total included 32 drums containing liquids; 127 drums of solids, including debris and molding sand; and 84 empty drums. Most drums containing liquids have a bung in place, while most drums containing solids have no lid present at all. Of the 84 empty drums, 73 are steel, six are plastic, and five are fiber. Note

that the empty steel drums can be regarded as scrap metal, while empty plastic and fiber drums can be regarded as solid waste.

- One raceway path north of the site remains clearly visible, based on fences, an arched building foundation, drain piping, and historical maps. Locations of other on-site surface raceways are not evident based on site conditions.

- Groundwater is not present in the site overburden. Groundwater was not encountered in any of the test pits excavated.

- Ambient radiation does not exceed typical background radiation levels, as measured using a pocket radiation meter capable of detecting alpha, beta, and gamma radiation.

### 4.1.2 Surface Soil Conclusions

- The background surface soil indicates a general enrichment of PAHs in the local surface soils. This is likely due to several PAH sources, including fallout from railroad engine soot, coal dust, and fallout from the railroad station fire near the site.

- Findings of elevated PAH concentrations in the railroad area are consistent with past uses for that part of the site. Coal, ash, and many lubricants are known to contain elevated PAH concentrations.

- While the molding sand contains the compound phenol at concentrations exceeding TAGM 4046 criteria, the total phenolic compound concentration does not exceed TAGM 4046 soil cleanup criteria. Concentrations of chromium, copper, and nickel may require a more detailed review and further regulatory agency interfacing to determine an appropriate molding sand management plan.

- Trichloroethene (TCE) presence in Raceway 1 is an anomaly. It may indicate that a recent TCE source exists upgradient of the area; however, conclusion can not be made with absolute certainty based solely on one sample. An elevated zinc concentration in RW02, as compared with the background concentration (2,630 µg/kg versus 326 µg/kg) indicates the drain pipe directly above the sample location once served as a zinc source. It is possible that the decaying pipe itself, as well as the pipe contents, are possible sources.

- There is no evidence of a PCB release at the former electrical transformer area located on the southern side of the building.

### 4.1.3 Building Interior Conclusions

- PCBs were detected in subfloor soil sample DF-Sub07-SO. Neither the aereal extent nor the depth of the PCB presence has been defined. While the concentrations detected may be quite low, the presence indicates a nearby PCB source has existed at some time in the past.

- The concrete floor thickness varies from 3 to 7 inches. Most of the floor is intact and contains few significant fractures.

- Elevated copper presence in subfloor soil samples is likely consistent with past foundry operations.

- There are no mercury sources immediately identifiable on site that would likely lead to an enrichment of mercury in site soils. One possible mercury source is electrical switches, although it is not known if this type of switch was used in the areas were elevated concentrations of mercury were identified. The soils at locations Sub7 and Sub8 exceed TAGM 4046 cleanup criteria and may require remediation, depending on the cleanup approach implemented at the site.

- PCB (Aroclor 1242) is present in the sediment of sump 3, located at the electrical control room. These data indicate at least one PCB release has occurred in the vicinity. However, neither the volume released, nor the release source were identified. Aroclor 1242 was commonly used in electrical equipment; thus its presence is considered consistent with the operational area use.

- The highly volatile nature of acetone, as well as its presence in some sump water and subfloor soil samples indicates that a current acetone source may be contributing to the sump water. It further indicates that acetone was used on site.

## 4.2 Conceptual Site Model

The Dussault Foundry Site is positioned on a veneer of soil overlying the bedrock. The soil thickness is believed to increase from south to north, based on the natural topography of the surrounding area and the anomalous level nature of the site along an escarpment.

Foundry operations on the site generated phenol-containing molding sand waste. This waste sand was placed in piles to the east of the site; along the hillside north of the site; and on the west end of the site. Sufficient west end molding sand was added to the site to raise the westerly site topographic grade to an elevation higher than that of the building's west end.

At least one UST, labeled as an IPA tank, has leaked and released its contents to the subsurface soils. The final destination of the contents has not been identified; it is a function primarily of the total volume released and the thickness of soil underlying the tanks. Soil conditions observed indicate a clay and silt-rich soil underlies this tank. The nature of this soil is expected to absorb and hold a large portion of the released contents.

Liquids have likely entered the subsurface soil underlying the buildings' concrete floors; most likely through fractures in the flooring. PCBs and acetone are present in the subfloor soil.

NYSDEC's site spill records indicate PCB-containing liquids may have entered into a drainage pathway on the northeast side of the building. While the drainage way location was not identified on site, PCBs are expected to have been attenuated within the drainageway sediment due to the organic nature of sediments and the clay-rich native soils of the area.

Studies of unconsolidated deposits (overburden) and the uppermost portion of the underlying bedrock units have been at the conducted at sites several miles west of the Dussault Foundry Site. Geologic data collected at those sites as well as this site together indicate the total overburden thickness varies from approximately 5 to 18 feet. Unconsolidated deposits consist of reworked topsoil/fill, lacustrine deposits, and glacial till. The bedrock immediately underlying the overburden is Middle Silurian Lockport Dolostone, which consists mainly of gray to brownish gray, fine- to coarse-grained dolostone. The top 10 feet of the Lockport Dolostone is generally fractured more than the deeper portions of the rock. The rock contains mainly horizontal bedding plane fractures but also contains a few vertical fracturing (joints and stress relief fractures). Of particular importance is that fracture concentrations were found to vary greatly between locations. Other rock features observed include fossil algal and coral structures, stylolites, vugs, and secondary mineralization (Isachsen, et al. 1991).

Most of the groundwater present in the overburden and the shallow bedrock at those study areas originates locally as infiltration; there is little regional flow within the shallow bedrock aquifer. Because of its low hydraulic conductivity and the underlying transmissive weathered shallow bedrock zone, little lateral movement through the overburden is expected. Thus, the primary hydrogeologic role of the overburden is to transmit infiltrating meteoric water to the shallow bedrock aquifer.

## 4.3 Recommendations

The E & E/ Foit-Albert team is submitting the following recommendations for your review. If approved, each will be listed in the Phase II report.

The following recommendations have been made based on the findings presented in this Phase II report. They are divided into Additional Assessment Activities

and Other Site Activities. Note that these activities are beyond the scope of work of this Phase II.

### 4.3.1 Additional Assessment Activities

1. **Additional Groundwater Assessment.** A groundwater assessment will likely be required to fully determine whether the site has negatively impacted local groundwater conditions. A simplified approach consisting of narrow PVC groundwater wells could provide an effective initial assessment that would determine whether a more extensive groundwater investigation involving bedrock wells is necessary.

2. **Additional Tank Identification.** Piping located along the northern wall of the cleaning room and along the northern wall of the foundry area indicate at least one additional AST may have been present along the northern side of the building, and perhaps one UST also may have been present at one time. While the presence of piping does not always indicate a tank was ever actually used, further exploration in these areas may be necessary. Note that specialized equipment such as a drill probe mounted on a 4-wheel-drive vehicle (which was beyond the scope of this work assignment) would be required to conduct such a search due to the very tight access path along the northern side of the building.

3. **Determine PCB Spill Location Through NYSDEC Staff.** Although the reported PCB spill was never located, it may be possible to determine who had visited the site and prepared the spill report. If possible, arrange for a site meeting to determine the exact area of concern.

4. **Additional Subsurface Soil Delineation.** The vertical and horizontal extent of subfloor soil containing elevated metals concentrations will likely require delineation. Depending on future use, additional PAH characterization in railroad area soils also may require further delineation. Note that such a delineation would likely be impractical if the area is to be covered by asphalt pavement, a PAH-rich material.

### 4.3.2 Other Site Activities

1. **Perform A Property Boundary Survey.** Future developers will require the seller of the property to identify the property boundaries. A site property boundary survey identifying not only the property boundary locations but also the buildings and other fixed features would likely be of great use in marketing the property.

2. **Limit Site Access.** Concrete rubble found along the northeast dirt road outside the cleaning building was observed during the June 2002 Drum Inventory Updating. This rubble was not present at the time of the December 2001 field

activities, indicating the site is still being used as a dump site. Also, an active vagabond encampment was noted at the western end of the foundry building.

3. **Fill In Sump Pits.** Open doors that were not previously open indicate the area is visited by trespassers. There are no warning signs or covers over the floor pits, all of which contain water and one of which contains PCB-contaminated sediment. It would be prudent for the site owner to minimize possible future contact with the contents of these sumps.

4. **Remove the Alcohol UST and Perform Proper Tank Closure.** Soil data indicate that this tank has leaked. Any product remaining in the tank has the potential to leak out into the surrounding subsoil, as well. While the tank may be empty, the subsoil will still require cleanup.

5. **Asbestos Survey.** In the event that future use of the site involves demolition of the site buildings, conducting an asbestos survey prior to demolition is highly recommended due to the age of the facility and the presence of specialized equipment (such as the oven) that suggest the presence of non-flammable insulation.

# 5 References


Ecology and Environment, Inc. (E & E), 2001, Work Plan for a Phase II Site Environmental Assessment at the Dussault Foundry Site, Lockport, New York Ecology & Environment, Inc., Lancaster, New York.

Ecology and Environment Engineering P.C. (E & E PC), 1989, Phase I Investigation, Dussault Foundry, Site Number 932012, City of Lockport, Niagara County; Ecology & Environment Engineering, P.C., Lancaster, New York.

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Isachsen, Y.W., E. Landing, J.M. Lauber, L.V. Rickard, and W.B. Rogers, 1991, *Geology of New York*, New York State Museum, Albany, New York.

Naval Meteorology and Oceanography Command (NMOC), 1996, "International Station Meteorological Climate Summary, CD-ROM Version 4.0, September 1996", available from National Climatic Data Center, Asheville North Carolina.

NYSDEC, 1994, Technical and Administrative Guidance Memorandum (TAGM) No. 4046, Determination of Soil Cleanup Objectives and Soil Cleanup Levels, prepared by M.J. O'Toole, Jr. Division of Hazardous Waste Remediation, NYSDEC, Albany, New York.

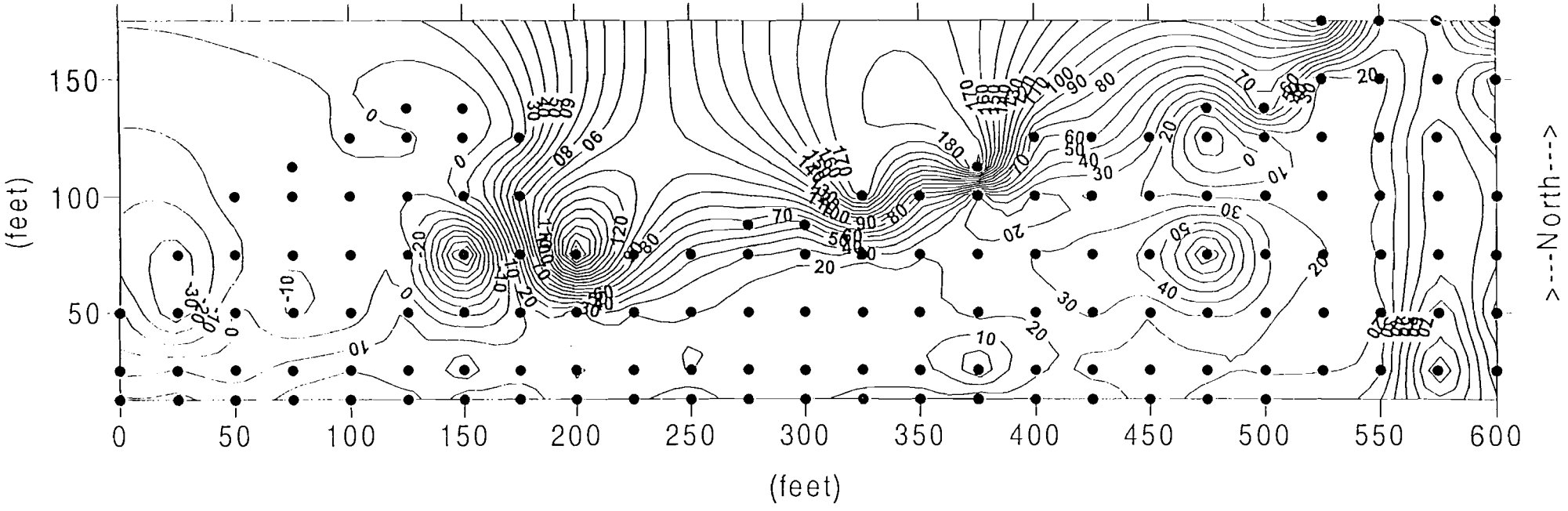
USEPA Region II, 1995, Establishing Background Levels; Directive 9285.7-19FS; PB94-963313; EPA/540/F-94/030; Washington, D.C.

_____, 1999, Draft Brownfields Project Planning Guidance, Volume 1: Targeted Brownfields Assessment Overview; USEPA, New York.

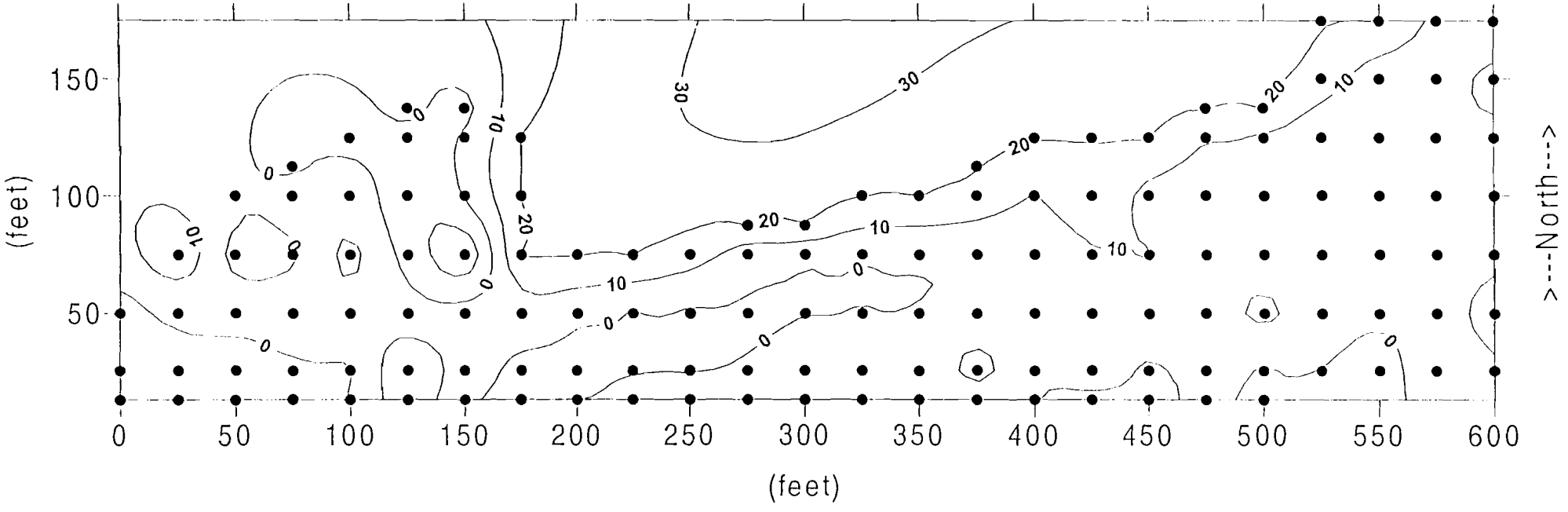
United States Geological Survey (USGS), 1980, 7.5 Minute Topographic Map, Lockport, New York Quadrangle.

# A Geophysical Survey Data Plots

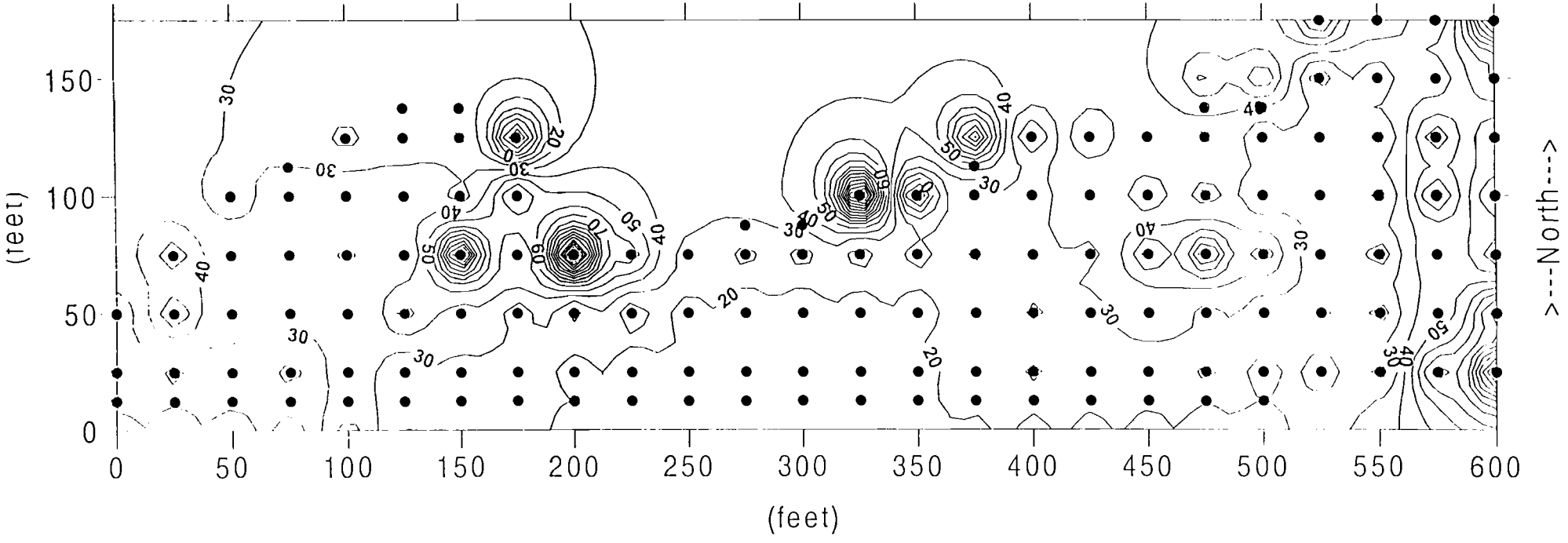
# Dussault Foundry
## EM31 Conductivity Survey
## Vertical Dipole Orientation 1
## Contour Interval = 10 millimhos/meter



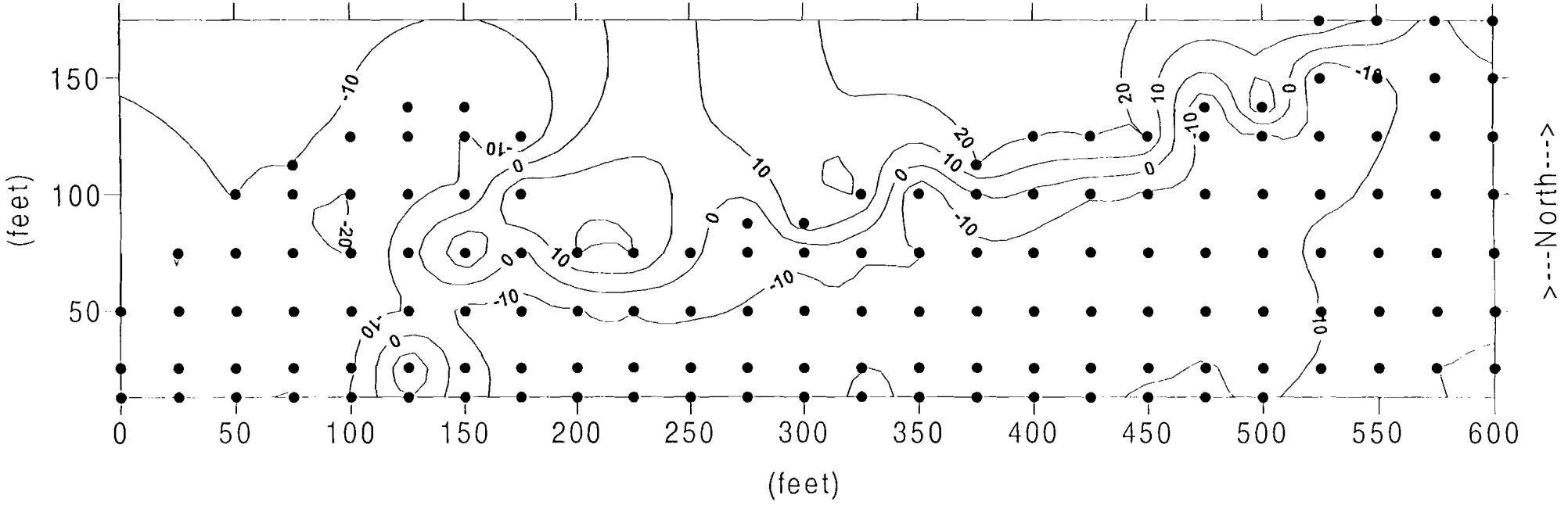
# Dussault Foundry
## EM31 Inphase Survey
## Vertical Dipole Orientation 1
## Contour Interval = 10 parts per thousand



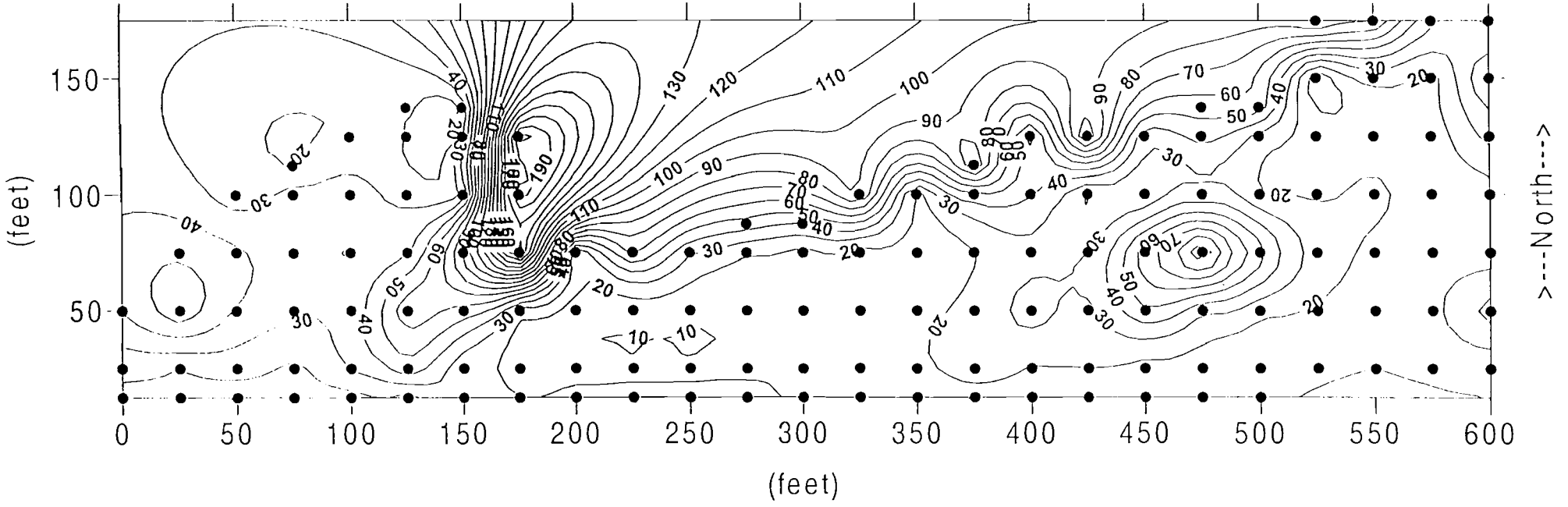
# Dussault Foundry
## EM31 Conductivity Survey
## Horizontal Dipole Orientation 1
## Contour Interval = 10 millimhos/meter



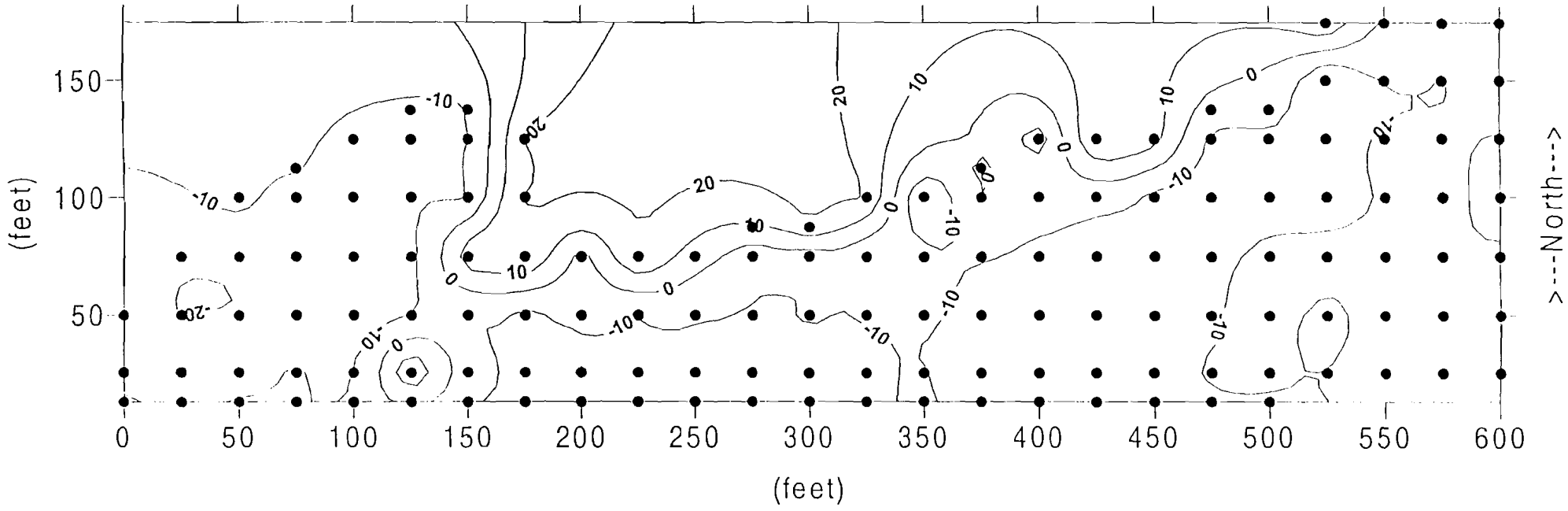
# Dussault Foundry
## EM31 Inphase Survey
## Horizontal Dipole Orientation 1
## Contour Interval = 10 parts per thousand



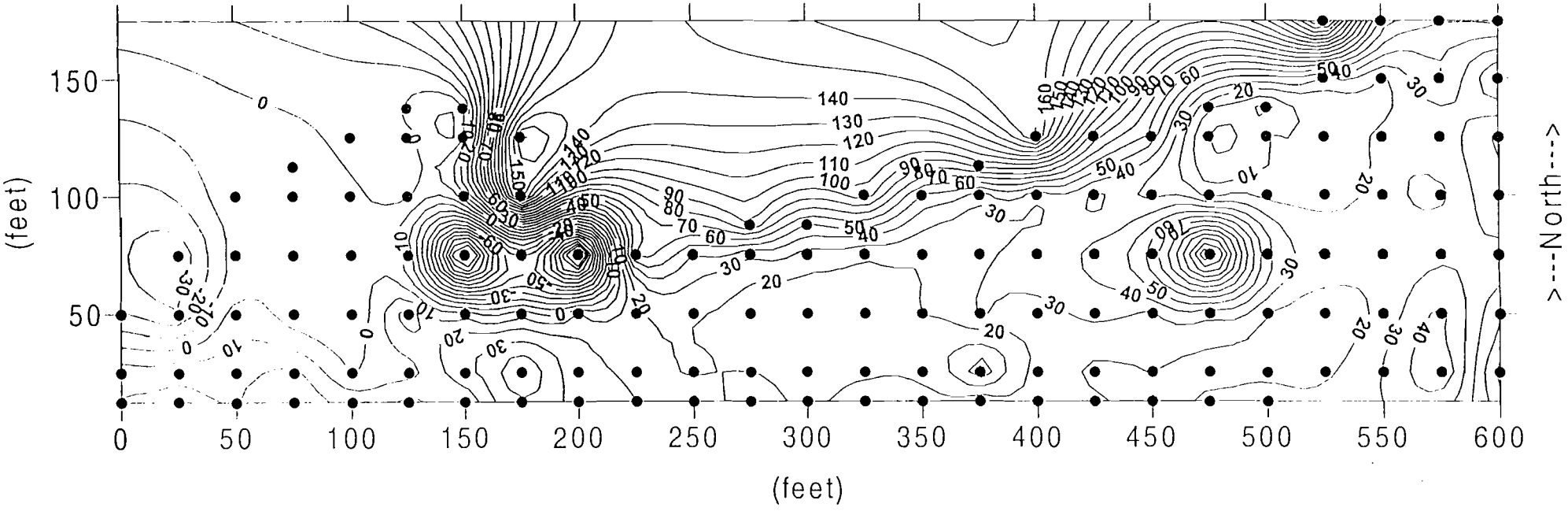
# Dussault Foundry
## EM31 Conductivity Survey
## Horizontal Dipole Orientation 2
## Contour Interval = 10 millimhos/meter



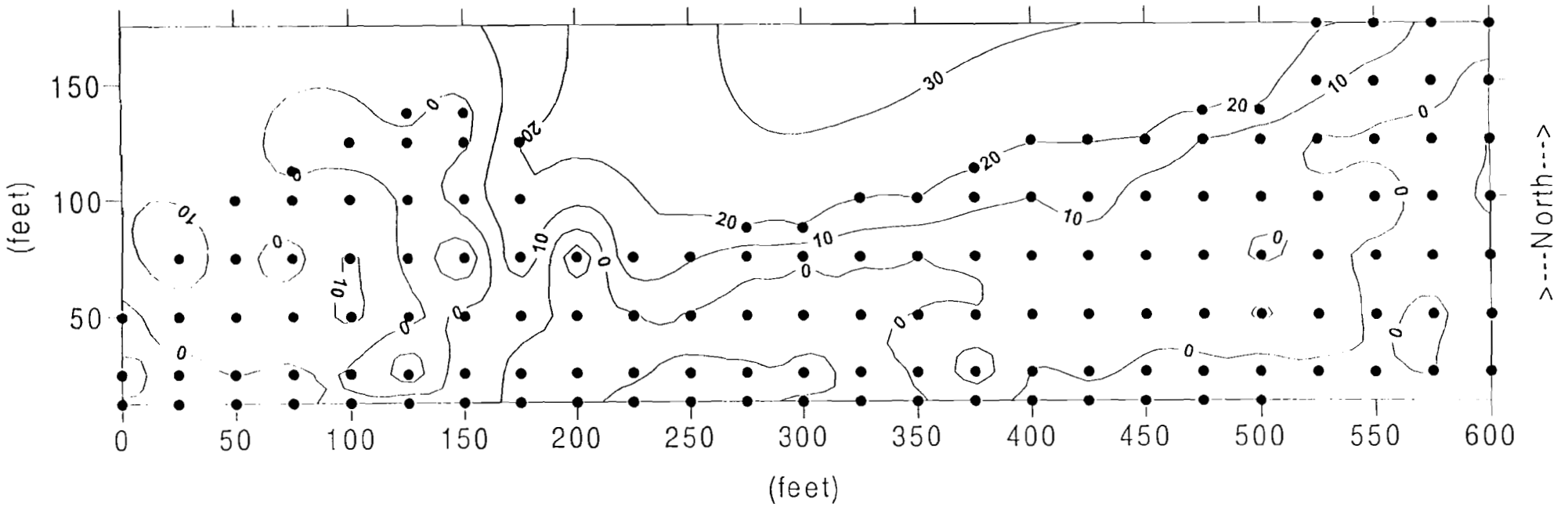
# Dussault Foundry
## EM31 Inphase Survey
## Horizontal Dipole Orientation 2
## Contour Interval = 10 parts per thousand



# Dussault Foundry
# EM31 Conductivity Survey
# Vertical Dipole Orientation 2
# Contour Interval = 10 millimhos/meter



# Dussault Foundry
## EM31 Inphase Survey
## Vertical Dipole Orientation 2
## Contour Interval = 10 parts per thousand



# B Drum Inventory

Drum Inventory, 12/5/01, Updated 6/3/02
Dussault Foundry Site

| Drum Number | Location | Drum Size | Drum Material | Volume Estimate | Contents | Drum Label | Is Drum Viable? | Open or Closed Head? | Lid or Bung Present? |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 55-gallon | Steel | Full | sand and scale | None | Yes | Open | No |
| 2 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 3 | | 55-gallon | Steel | 3/4 full | Debris | None | Yes | Open | No |
| 4 | | 55-gallon | Steel | 1/8 full | liquid | None | Yes | Closed | Yes |
| 5 | | 55-gallon | Steel | 3/4 full | Trash | None | Yes | Open | No |
| 6 | | 55-gallon | Steel | full | Debris and sand | None | Yes | Open | No |
| 7 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 8 | | 55-gallon | Steel | Full | sand | Refcohol | Yes | Open | No |
| 9 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 10 | | 55-gallon | Steel | Full | sand | Perma-steel size | Yes | Open | No |
| 11 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 12 | | 55-gallon | Steel | Full | sand and debris | Refcohol | Yes | Open | No |
| 13 | | 55-gallon | Steel | 2/3 full | sand | None | Yes | Open | No |
| 14 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 15 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 16 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 17 | | 55-gallon | Steel | Full | sand | Refcohol | Yes | Open | No |
| 18 | | 30-gallon | Steel | empty | | None | Yes | Open | No |
| 19 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 20 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 21 | | 55-gallon | Steel | Full | sand | Refcohol | Yes | Open | No |
| 22 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 23 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 24 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 25 | | 30-gallon | Steel | Full | sand | None | Yes | Open | No |
| 26 | | 30-gallon | Steel | empty | | None | Yes | Open | No |
| 27 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 28 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 29 | | 55-gallon | fiber | 1/2 full | sand | None | Yes | Open | No |
| 30 | | 55-gallon | plastic | empty | | None | Yes | Closed | Yes |
| 31 | | 55-gallon | plastic | empty | | None | Yes | Closed | Yes |
| 32 | Within cleaning building, | 55-gallon | plastic | empty | | None | Yes | Closed | Yes |
| 33 | mostly on south side | 55-gallon | plastic | empty | | Refcohol | Yes | Closed | Yes |
| 34 | | 40-gallon | Steel | Full | debris | None | Fair | Open | No |
| 35 | | 55-gallon | Steel | Full | debris/sand | None | Fair | Open | No |
| 36 | | 55-gallon | Steel | Full | debris/sand | None | Fair | Open | No |
| 37 | | 55-gallon | Steel | Full | debris/sand | None | Fair | Open | No |
| 38 | | 55-gallon | Steel | Full | debris/sand | None | Fair | Open | No |
| 39 | | 55-gallon | Steel | Full | sand | None | Fair | Open | No |
| 40 | | 55-gallon | Steel | Full | sand | None | Fair | Open | No |
| 41 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 42 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 43 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 44 | | 30-gallon | Steel | Full | sand | None | Yes | Open | No |
| 45 | | 55-gallon | Steel | 3/4 full | sand | None | Yes | Open | No |
| 46 | | 55-gallon | Steel | Full | sand | None | Yes | Open | No |
| 47 | | 25-gallon | Steel | Full | sand | None | Yes | Open | No |
| 48 | | 25-gallon | Steel | Full | Solid granular material | None | Yes | Open | No |
| 49 | | 25-gallon | Steel | Full | Solid granular material | None | Yes | Open | No |
| 50 | | 25-gallon | Steel | Full | Solid granular material | None | Yes | Open | No |
| 51 | | 55-gallon | plastic | full | Liquid | None | Yes | Closed | Yes |
| 52 | | 55-gallon | fiber | empty | | None | Yes | Open | No |
| 53 | | 55-gallon | Steel | empty | | None | Yes | Closed | No |
| 54 | | 55-gallon | Steel | Full | Liquid | None | Yes | Closed | Yes |
| 55 | | 55-gallon | Steel | empty | | None | Yes | Closed | No |
| 56 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 57 | | 30-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 58 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 59 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 60 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 61 | | 30-gallon | fiber | empty | | None | Yes | Open | No |
| 62 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 63 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 64 | | 55-gallon | Steel | 3/4 Full | sand | None | Yes | Open | No |
| 65 | | 55-gallon | fiber | Full | sand | None | No | Open | No |
| 66 | Within cleaning building, | 55-gallon | Steel | Full | Sand | Is Coatings | Yes | Open | No |

Drum Inventory, 12/5/01, Updated 6/3/02
Dussault Foundry Site

| Drum Number | Location | Drum Size | Drum Material | Volume Estimate | Contents | Drum Label | Is Drum Viable? | Open or Closed Head? | Lid or Bung Present? |
|---|---|---|---|---|---|---|---|---|---|
| 67 | mostly on south side | 55-gallon | fiber | 1/4 Full | Debris | None | No | Open | No |
| 68 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 69 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 70 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 71 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 72 | | 55-gallon | Steel | 1/2 Full | Debris | None | No | Open | No |
| 73 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 74 | | 55-gallon | Steel | 1/2 Full | Debris | None | No | Open | No |
| 75 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 76 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 77 | Cluster approximately 100 Feet east of Cleaning Building's east end | 30-gallon | Steel | 1/2 Full | Debris | None | No | Open | No |
| 78 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 79 | | 55-gallon | Steel | 1/3 Full | Liquid | None | Yes | Closed | Yes |
| 80 | | 55-gallon | Steel | 1/2 Full | Debris | None | No | Open | No |
| 81 | | 55-gallon | Steel | 1/8 Full | Debris | None | No | Open | No |
| 82 | | 55-gallon | Steel | 1/8 Full | Debris | None | No | Open | No |
| 83 | | 55-gallon | Steel | Full | Water | None | Yes | Open | No |
| 84 | | 55-gallon | Steel | empty | | None | Yes | | Yes |
| 85 | | 55-gallon | Steel | 1/3 Full | Debris | None | Yes | Open | No |
| 86 | | 55-gallon | plastic | empty | | None | Yes | Closed | Yes |
| 87 | | 55-gallon | plastic | Full | Debris | None | No | Open | No |
| 88 | | 30-gallon | Steel | Full | Sand | None | Fair | Open | No |
| 89 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 90 | | 55-gallon | Steel | Full | Sand | None | Yes | Open | No |
| 91 | | 55-gallon | Steel | 1/4 Full | Sand | None | Yes | Open | No |
| 92 | | 55-gallon | Steel | 1/4 Full | Debris | None | No | Open | No |
| 93 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 94 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 95 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 96 | | 55-gallon | Steel | 1/4 Full | Debris | None | Yes | Open | No |
| 97 | | 55-gallon | fiber | 1/2 full | sand | None | Yes | Open | No |
| 98 | | 55-gallon | fiber | 2/3 full | Debris | None | Yes | Open | No |
| 99 | | 30-gallon | fiber | empty | | None | No | Open | No |
| 100 | | 30-gallon | fiber | empty | | None | Yes | Open | No |
| 101 | | 55-gallon | fiber | 1/2 full | Debris | None | Yes | Open | No |
| 102 | | 55-gallon | Steel | 1/2 full | Debris | None | No | Open | No |
| 103 | | 55-gallon | Steel | Full | Liquid | None | Yes | Closed | Yes |
| 104 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 105 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 106 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 107 | | 40-gallon | Steel | 1/4 Full | Debris with rain water | None | Yes | Open | No |
| 108 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 109 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 110 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 111 | | 55-gallon | fiber | Full | Debris | Ferro Silicon | No | Open | No |
| 112 | Foundry Building | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 113 | | 55-gallon | fiber | empty | | None | No | Open | No |
| 114 | | 55-gallon | Steel | 3/4 Full | Debris | None | Yes | Open | No |
| 115 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 116 | | 55-gallon | plastic | 1/2 full | liquid; extended end | None | Yes | Closed | No |
| 117 | | 55-gallon | plastic | 1/3 full | Tolusulfunc Acid | None | Yes | Closed | Yes |
| 118 | | 55-gallon | plastic | Full | Tolusulfuric Acid | None | Yes | Closed | Yes |
| 119 | | 55-gallon | Steel | Full | debris | None | Yes | Open | No |
| 120 | | 55-gallon | plastic | Full | Debris | Acid | Yes | Closed | No |
| 121 | | 55-gallon | fiber | 3/4 Full | Debris | None | Yes | Open | No |
| 122 | | 55-gallon | fiber | 3/4 Full | Debris | None | Yes | Open | No |
| 123 | | 55-gallon | Steel | 1/8 Full | Debris | None | Yes | Open | No |
| 124 | | 55-gallon | Steel | 3/4 Full | Sand | None | Yes | Open | No |
| 125 | | 55-gallon | Steel | 3/4 Full | Sand | None | Yes | Open | No |
| 126 | | 55-gallon | Steel | 1/2 Full | Debris | None | Yes | Open | No |
| 127 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 128 | | 55-gallon | Steel | 1/3 full | liquid | None | Yes | Closed | Yes |
| 129 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 130 | | 55-gallon | Steel | 1/2 Full | Liquid | Westcast WC-5 Catalyst | Yes | Closed | Yes |

Drum Inventory, 12/5/01, Updated 6/3/02
Dussault Foundry Site

| Drum Number | Location | Drum Size | Drum Material | Volume Estimate | Contents | Drum Label | Is Drum Viable? | Open or Closed Head? | Lid or Bung Present? |
|---|---|---|---|---|---|---|---|---|---|
| 131 | | 55-gallon | Steel | Full | Liquid | Westcast WC-5 Catalyst | Yes | Closed | Yes |
| 132 | | 55-gallon | Steel | Full | Liquid | Westcast WC-5 Catalyst | Yes | Closed | Yes |
| 133 | | 55-gallon | Steel | Full | Liquid | None | Yes | Open | Yes |
| 134 | | 55-gallon | Steel | Full | Liquid | Westcast WC-5 Catalyst | Yes | Closed | Yes |
| 135 | | 55-gallon | Steel | Full | Liquid | Westcast WC-5 Catalyst | Yes | Closed | Yes |
| 136 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 137 | | 55-gallon | Steel | Empty | | None | No | Open | No |
| 138 | | 55-gallon | plastic | empty | | None | No | Closed | No |
| 139 | | 25-gallon | fiber | Full | Debris | None | No | Open | No |
| 140 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 141 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 142 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 143 | Foundry Building | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 144 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 145 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 146 | | 55-gallon | fiber | Full | Debris | None | No | Open | No |
| 147 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 148 | | 55-gallon | Steel | 1/8 full | Liquid/sludge | None | Yes | Open | No |
| 149 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 150 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 151 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 152 | | 55-gallon | fiber | 3/4 Full | Debris | None | Yes | Open | No |
| 153 | | 55-gallon | Steel | 3/4 Full | Debris | None | Yes | Open | No |
| 154 | | 55-gallon | Steel | empty | | None | Yes | Closed | No |
| 155 | Quanset Hut | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 156 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 157 | | 55-gallon | fiber | Full | Debris | None | Yes | Open | No |
| 158 | | 55-gallon | Steel | 3/4 full | Debris | None | Yes | Open | No |
| 159 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 160 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 161 | | 55-gallon | Steel | empty | | None | Yes | Closed | No |
| 162 | | 55-gallon | Steel | 3/4 full | sand | None | Yes | Open | No |
| 163 | | 55-gallon | Steel | 3/4 full | sand | None | Yes | Open | No |
| 164 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 165 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 166 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 167 | | 55-gallon | Steel | empty | | Refcohol | Yes | Closed | Yes |
| 168 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 169 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 170 | Foundry Building | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 171 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 172 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 173 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 174 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 175 | | 55-gallon | Steel | 1/2 full | liquid | None | Yes | Closed | Yes |
| 176 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 177 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 178 | | 55-gallon | Steel | 1/8 Full | Debris | None | Yes | Open | No |
| 179 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 180 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 181 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 182 | | 55-gallon | Steel | 1/2 full | Liquid/sludge | None | Yes | Closed | Yes |
| 183 | | 55-gallon | Steel | Full | liquid | None | Yes | Closed | Yes |
| 184 | | 55-gallon | plastic | 1/2 Full | liquid | None | Yes | Closed | Yes |
| 185 | | 55-gallon | Steel | 3/4 full | Debris | None | No | Open | No |
| 186 | | 55-gallon | Steel | 3/4 full | Debris | None | No | Open | No |
| 187 | | 55-gallon | Steel | 1/3 full | Debris | Refcohol | Yes | Open | No |
| 188 | | 30-gallon | Steel | empty | | None | No | Open | No |
| 189 | | 55-gallon | Steel | empty | | None | Yes | Closed | No |
| 190 | | 55-gallon | Steel | 3/4 full | Debris | None | Yes | Open | No |
| 191 | Core Room Addition | 55-gallon | Steel | empty | | None | No | Open | No |
| 192 | | 55-gallon | Steel | empty | | None | Yes | Open | No |

Drum Inventory, 12/5/01, Updated 6/3/02
Dussault Foundry Site

| Drum Number | Location | Drum Size | Drum Material | Volume Estimate | Contents | Drum Label | Is Drum Viable? | Open or Closed Head? | Lid or Bung Present? |
|---|---|---|---|---|---|---|---|---|---|
| 193 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 194 | | 55-gallon | fiber | 1/3 full | Debris | None | No | Open | No |
| 195 | | 55-gallon | Steel | 1/2 full | Debris | None | No | Open | No |
| 196 | | 55-gallon | Steel | 1/8 Full | Debris | SG-A Slurry | Yes | Open | No |
| 197 | | 55-gallon | Steel | 1/3 full | Debris | None | No | Open | No |
| 198 | | 55-gallon | Steel | Full | liquid | None | Yes | Closed | No |
| 199 | | 55-gallon | Steel | 1/2 Full | Debris | None | Yes | Open | No |
| 200 | | 55-gallon | fiber | 1/2 Full | Debris | None | Yes | Open | No |
| 201 | | 55-gallon | Steel | 3/4 Full | sand | Refcohol | Yes | Open | No |
| 202 | | 55-gallon | Steel | 3/4 Full | liquid | None | Yes | Closed | No |
| 203 | | 55-gallon | fiber | 1/2 Full | shredded paper | None | Yes | Open | No |
| 204 | Core Room Addition | 55-gallon | plastic | Full | liquid | None | Yes | Closed | Yes |
| 205 | | 55-gallon | Steel | Full | liquid | None | Yes | Closed | Yes |
| 206 | | 55-gallon | plastic | Full | liquid | Toluene Sulfonic Acid - UN 2586 | Yes | Closed | Yes |
| 207 | | 55-gallon | Steel | Full | Debris | Refcohol | Yes | | Yes |
| 208 | | 55-gallon | Steel | empty | | P-78 Core Oil | Yes | Closed | Yes |
| 209 | | 55-gallon | Steel | empty | | None | No | Open | No |
| 210 | Northern side of building exterior | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 211 | | 55-gallon | Steel | Full | Debris | None | Yes | Open | Yes |
| 212 | | 30-gallon | Steel | 1/2 Full | Debris | Potassium Permanganate | Yes | Open | No |
| 213 | Northern Hillside, 50 feet west of northeast corner of building | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 214 | | 55-gallon | Steel | 1/2 full | Debris | None | Yes | Open | No |
| 215 | | 55-gallon | Steel | empty | Contents appear to have leaked out. | None | Yes | Closed | Yes |
| 216 | | 10-gallon | Steel | empty | | None | poor | Open | No |
| 217 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 218 | | 55-gallon | Steel | Full | Solids | None | Yes | Open | No |
| 219 | | 55-gallon | Steel | Full | Solids | None | Yes | Open | No |
| 220 | Northeasat Hillside | 55-gallon | Steel | Full | Solids | None | Yes | Open | No |
| 221 | | 55-gallon | Steel | Full | Solids | None | Yes | Open | No |
| 222 | | 55-gallon | Steel | Full | Solids | None | Yes | Open | No |
| 223 | | 55-gallon | Steel | 1/2 full | Debris | None | Yes | Open | No |
| 224 | | 55-gallon | Steel | 1/2 full | Debris | None | Yes | Open | No |
| 225 | | 55-gallon | Steel | 1/8 full | sand | None | Yes | Open | No |
| 226 | | 55-gallon | Steel | 3/4 Full | sand | None | No | Open | No |
| 227 | At doorway near isopropyl alcohol UST | 55-gallon | Steel | 1/2 full | Liquid | Core Oil | Yes | Open | Yes |
| 228 | Number not used | | | | | | | | |
| 229 | | 55-gallon | Steel | empty | | None | No | Open | Yes |
| 230 | Far east end of site, beyond | 55-gallon | Steel | empty | | Conspec | Yes | Closed | Yes |
| 231 | molding sand piles | 55-gallon | Steel | Full | Debris | None | Yes | Open | No |
| 232 | | 55-gallon | Steel | empty | | | Yes | Open | No |
| 232 | Eastern End of Cleaning | 55-gallon | Steel | Full | Liquid | Isopropanol | Yes | Closed | No |
| 234 | Building | 55-gallon | Steel | 1/4 Full | Debris | None | Yes | Open | No |
| 235 | | 55-gallon | Steel | Full | Liquid | None | Yes | Closed | Yes |
| 236 | Stall at Doorway At East end | 55-gallon | Steel | 1/2 Full | Liquid | Niagara Lubircant Company, Buffalo, NY | Yes | Closed | Yes |
| 237 | of Core Room Addition | 55-gallon | Steel | Full | Liquid | None | Yes | Closed | Yes |
| 238 | | 55-gallon | Steel | Empty | | Niagara Lubircant Company, Buffalo, NY | Yes | Closed | Yes |
| 239 | | 55-gallon | Steel | empty | | None | Yes | Open | No |
| 240 | | 30-gallon | fiber | 1/3 full | Debris | Avon/Agate Dry Parting | Yes | Open | No |
| 241 | Near tolusulfuric acid tanks | 55-gallon | Steel | Full | Liquid | None | Yes | Closed | Yes |
| 242 | in Foundry Building | 55-gallon | Steel | Full | Liquid | None | Yes | Open | No |
| 243 | | 55-gallon | Steel | empty | | None | Yes | Closed | Yes |
| 244 | | 55-gallon | Steel | 3/4 Full | Debris | None | Yes | Open | No |

# C Molding Sand Volume Calculations

# Dussault Foundry Site
## Molding Sand Volume Estimate

The total volume of molding sand on site (excluding miscellaneous sand within the building) was calculated based on field measurements obtained using a tape measure.

The approach used to estimate the sand volume consisted of dividing the area into four feature areas:

1. The 3 Sand Piles located on the eastern side of the site;
2. The Eastern Embankment, which was further divided into an eastern and western segment;
3. The Northern Embankment Area, which was further divided into the Main Building area, the Core Room Addition Area; and the Sand Mound; and
4. The Western End Area

Assumptions made are stated in the calculations.

A 15% contingency was added to all sand volumes calculated to account for error generated through simplistic data gathering means. A much more accurate sand volume estimate could be generated by conducting a topographic survey of the site surface and test pit depths.

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## General Computation Sheet

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 1 of 11 | Project No. |

Name of Project: Dossaut Foundry Phase I System:

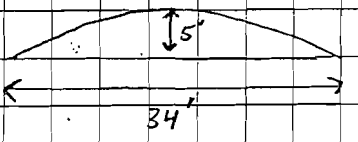
Subject: East End Sand File Volume

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JW 3 7/9/02 | Initials: MMG 4/3/02 |
| | Initials: / / | Initials: / / |

1. ASSUMPTIONS:
   1. SAND PILES ARE COMPRISED ONLY OF MOLDING SAND.

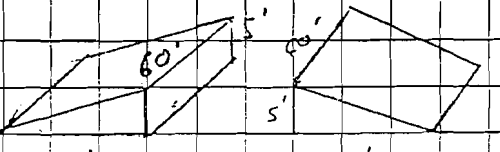
ASOUTHERN SAND FILE VOLUME ESTIMATE:


PLAN VIEW




CROSS-SECTIONAL VIEW

APPROACH: CONSIDER PILE AS TWO TRIANGULAR-PROFILED PIECES IDENTICAL IN SIZE




$$V_T = \left[\left[\frac{1}{2}(b \times h)\right] \times L\right] 2$$

$V_T = b \times h \times L$

$V_T = 17' \times 5' \times 60'$

$V_T = 5{,}100\ FT^3$

$V_T = 189\ YD^3$

ASSUMING 15% CONTINGENCY = 218 $YD^3$

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# General Computation Sheet

Calculation Set No.
Preliminary ☐
Final ☒
Void ☐
Sheet 2 of 11 Project No.

Name of Project DUSSAULT FOUNDRY PHASE II System

Subject EAST END SAND PILE VOLUME

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JW 3 AUG | Initials: MMG 4/3/10 |
| | Initials: / / | Initials: / / |

1B. NORTHERN SAND PILE VOLUME

USE SAME APPROACH AS THAT USED FOR SOUTHERN SAND PILE.

PILE DIMENSIONS: L = 53'
W = 18'
H = 5.25'

TRIANGULAR-PROFILE DIMENSIONS:
BASE = 9'
LENGTH = 53'
HEIGHT = 5.25'

$V_T = \left(\frac{53' \times 9' \times 5.25'}{2}\right) 2$

$V_T = 53' \times 9' \times 5.25'$

$V_T = 2,504.5 ft^3$

$V_T = 93 YD^3$

ASSUMING 15% CONTINGENCY: 107 $YD^3$

1C. MOUND NORTH OF CLEANING BUILDING

- ASSUME SAME APPROACH.
- PILE DIMENSIONS:
  L = 65'
  W = 15'
  H = 4'

- TRIANGULAR PROFILE DIMENSIONS: BASE = 7.5'
  HEIGHT = 4'
  LENGTH = 65'

$V_T = 7.5' \times 4' \times 65'$
$V_T = 1950 ft^3$
$V_T = 72 YD^3$
ASSUMING 15% CONTINGENCY: 83 $YD^3$

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**General Computation Sheet**

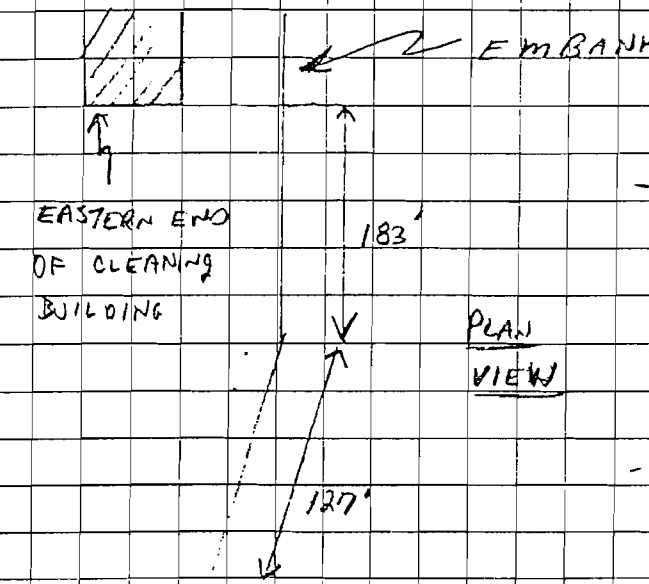
| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☐ |
| Void | ☐ |
| Sheet 3 of 11 | Project No. |

Name of Project DUSSAULT FOWLEY PHASE I System

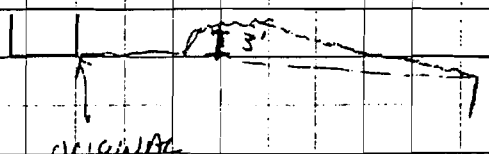
Subject EAST END EMBANKMENT

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: [illegible] | Initials: MAG 4 BIC |
| | Initials: [illegible] | Initials: |

2. EAST END EMBANKMENT SAND VOLUME ESTIMATE




- EMBANKMENT LENGTH DIVIDED INTO TWO REACHES
  - WESTERN REACH LENGTH 183'
  - EASTERN REACH LENGTH 127'
- RETAINING WALL ON INLAND SIDE 22' EAST OF EMBANKMENT; ASSUME WALL EXTENDS ENTIRE LENGTH OF EMBANKMENT
- RETAINING WALL IS 22' NORTH OF TOP OF EMBANKMENT
- ASSUME SAND DUMPED OVER EDGE OF EMBANKMENT IS THICKEST AT EMBANKMENT TOP, THEN EVENLY TAPERS TO TOP OF RETAINING WALL
- ASSUME ORIGINAL GRADE WAS THE ELEVATION OF THE SOIL AT THE BASE OF THE BUILDING




- MOUND HEIGHT IS 3' ABOVE GRADE AT RIDGE TOP

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## General Computation Sheet

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 4 of 4 | Project No. |

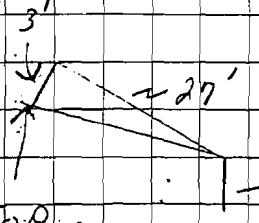
Name of Project Dearborn Foundry Site Phase II System

Subject EAST EMBANKMENT VOLUME ESTIMATE

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JW 3 GW | Initials: MMG 4/30 |
| | Initials: / / | Initials: / / |

2 (CONTINUED)

VOLUME OF SAND IS ESTIMATED AS A TRIANGULAR PRISM, ASSUMING SAND FORMS A RIGHT TRIANGLE.




TOP:
EMBANKMENT

CROSS-SECTIONAL VIEW

$a^2 + b^2 = c^2$

$3^2 + b^2 = 27^2$

$b^2 = 720$

$b = 26.8$ ft

VOLUME OF SAND ALONG WESTERN REACH

$V_1 = \left[\left(\frac{1}{2}\right) b \cdot h\right] \cdot L$

$V_1 = \left[\frac{3 \cdot 26.8'}{2}\right] \cdot 183' = 7,357\ ft^3$

$V_1 = 272\ YD^3$

Assuming 15% contingency: $313\ YD^3$

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## General Computation Sheet

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 5 of 11 | Project No. |

Name of Project DUSSAULT FOUNDRY PHASE II System

Subject EMBANKMENT VOLUME ESTIMATE

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: [illegible] | Initials: MMG 4/30/07 |
| | Initials: / / | Initials: / / |

2 (CONTINUED)

2.3 VOLUME ESTIMATE OF EASTERN EMBANKMENT AT EAST END OF SITE

- APPLY SAME APPROACH AS APPLIED TO WESTERN END.

$V_T = \left[\left(\frac{1}{2}\right) b \cdot h\right] \cdot L$

$V_T = \left[\left(\frac{1}{2}\right) \cdot 3 \cdot 26.8\right] \cdot 127'$

$V_T = 5,105 \text{ ft}^3$

$V_T = 189 \text{ yd}^3$

ASSUMING 15% CONTINGENCY, VOLUME = 218 $yd^3$

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**General Computation Sheet**

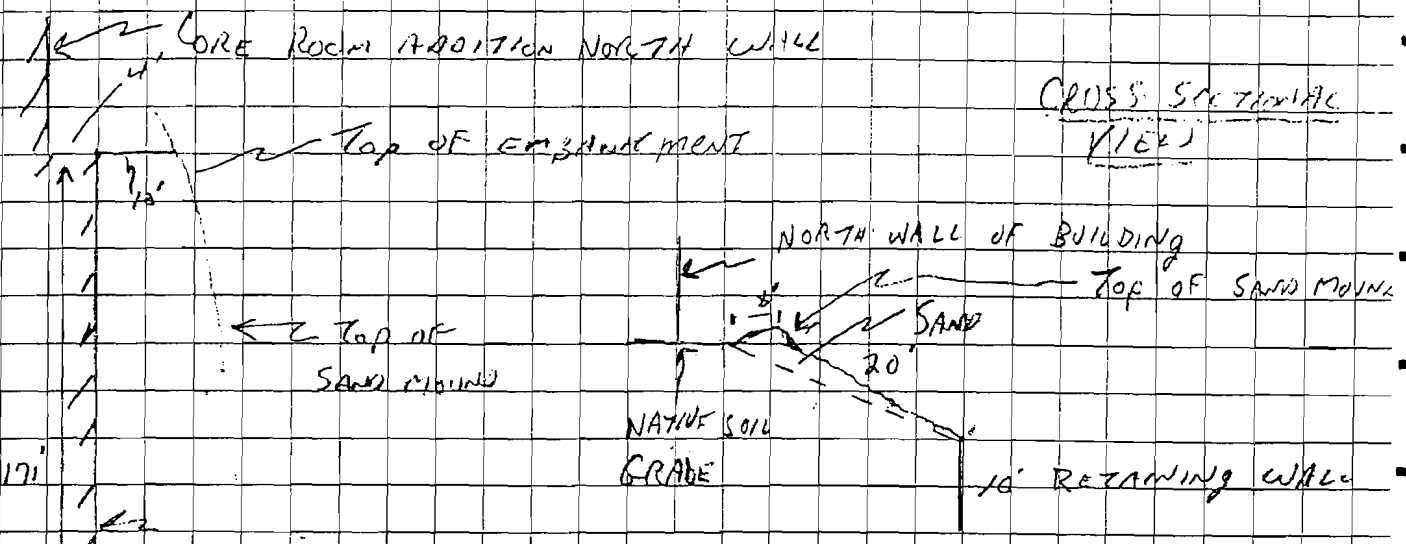
| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 6 of 11 | Project No. |

Name of Project DUSSAULT FOUNDRY PHASE II System

Subject MIDDLE EMBANKMENT AREA

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JM 3/7/01 | Initials: MMG 4/13/01 |
| | Initials: / / | Initials: / / |

3A. MIDDLE EMBANKMENT AREA NORTH OF BUILDINGS




- Top of sand mound to retaining wall = 20'
- Width of mound at native grade is 10' at west end, 18' at eastern end.
- Assume embankment has been built northward uniformly by 8'
- Assume side profile of sand fill is a right triangle
- Volume = $\left(\left(\frac{1}{2}\right) b \cdot h\right) \cdot L$

⇒ Height for triangle is calculated by: $a^2 + b^2 = c^2$

$8^2 + b^2 = 20^2$

$b = 18.3$

⇒ Volume = $\left[\left(\frac{1}{2}\right)(8' \cdot 18.3')\right] \cdot 171'$

$V_T = 12{,}517\ ft^3$ ; OR $464\ yd^3$

ASSUMING 15% CONTINGENCY, $533\ yd^3$

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# General Computation Sheet

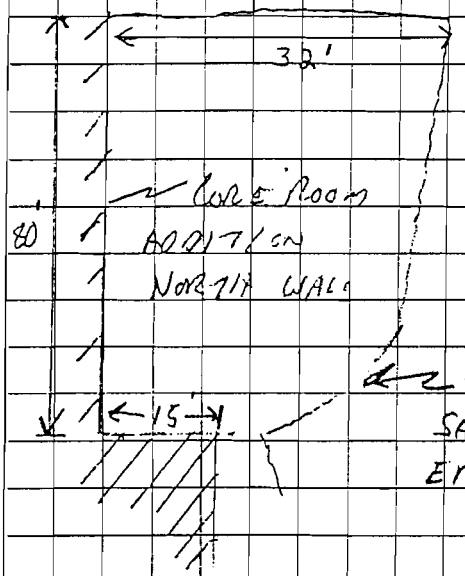
| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☑ |
| Void | ☐ |
| Sheet 7 of 11 | Project No. |

Name of Project: DUSSAULT FOUNDRY PHASE II System: ____

Subject: CORE ROOM ADDITION NORTH SIDE VOLUME

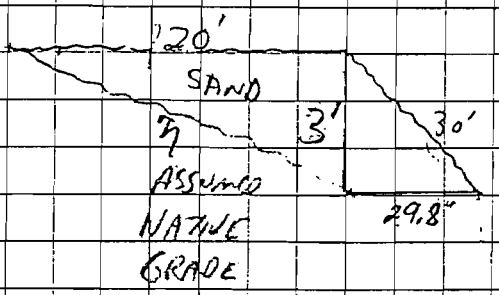
| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: [illegible] 3/27/02 | Initials: MMG 4/3/02 |
| | Initials: / / | Initials: / / |

3B. THE CORE ROOM ADDITION EMBANKMENT AREA IS PARTIALLY COVERED BY A LARGE SAND MOUND, IN ADDITION TO THE SAND LAYER WHICH EXTENDS ALONG THE ENTIRE SEGMENT OF THE CORE ROOM ADDITION EMBANKMENT. THIS SAND MOUND IS ESTIMATED SEPARATELY.




⇒ ASSUME SURFACE AREA WIDTH AVERAGES 20', CALCULATED AS $\left[\frac{(32-15)}{2} + 15\right] - 3.5'$ EDGE OF BUILDING

⇒ ASSUME SAND PROFILE IS TRIANGULAR




$a^2 + b^2 = c^2$

$3^2 + b^2 = 30^2$

$b = 29.8$

⇒ ASSUME SAND IS 3' THICK EDGE OF BUILDING BASED ON TEST PIT OBSERVATIONS

⇒ CALCULATE VOLUME AS TWO TRIANGLES:

$V_T = \left(\left[\frac{1}{2}(20' \cdot 3')\right] 80'\right) + \left(\left[\frac{1}{2}(29.8' \cdot 3')\right] 80'\right)$

$V_T = 2{,}400\ ft^3 + 3576\ ft^3$

$V_T = 5{,}976\ ft^3$

$V_T = 221\ yd^3$

ASSUMING 15% CONTINGENCY: $254\ yd^3$

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## General Computation Sheet

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 2 of 11 | Project No. |

Name of Project DUSSAULT FOUNDRY PHASE II System

Subject SOIL MOUND AT CORE ROOM ADDITION

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: [illegible] 3/29/02 | Initials: MM & WJC |
| | Initials: / / | Initials: / / |

3C. SOIL MOUND AT CORE ROOM ADDITION

⇒ CALCULATE ONLY SAND ABOVE GRADE; SAND BELOW EXISTING GRADE IS ADDRESSED AS "WEST END SAND"

⇒ ASSUME SAND MOUND IS UNIFORMLY CONICAL

⇒ Height of MOUND ABOVE GRADE: APPROXIMATELY 4'

⇒ $V_c = \left[\frac{1}{3}(\pi r^2)\right] h$

ASSUME BASE WIDTH of MOUND TO BE 30'. BASED ON FIELD MEASUREMENTS

$V_c = \left(\left(\frac{1}{3}\right) \pi \cdot 15^2\right) \cdot 4$

$V_c = 942 \text{ ft}^3$

$V_c = 35 \text{ yd}^3$

ASSUMING 15% CONTINGENCY, 40 $\text{yd}^3$

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ecology and environment, inc.

**General Computation Sheet**

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 7 of 11 | Project No. |

Name of Project DUSSAULT FOUNDRY PHASE II System

Subject WEST END SAND VOLUME ESTIMATE

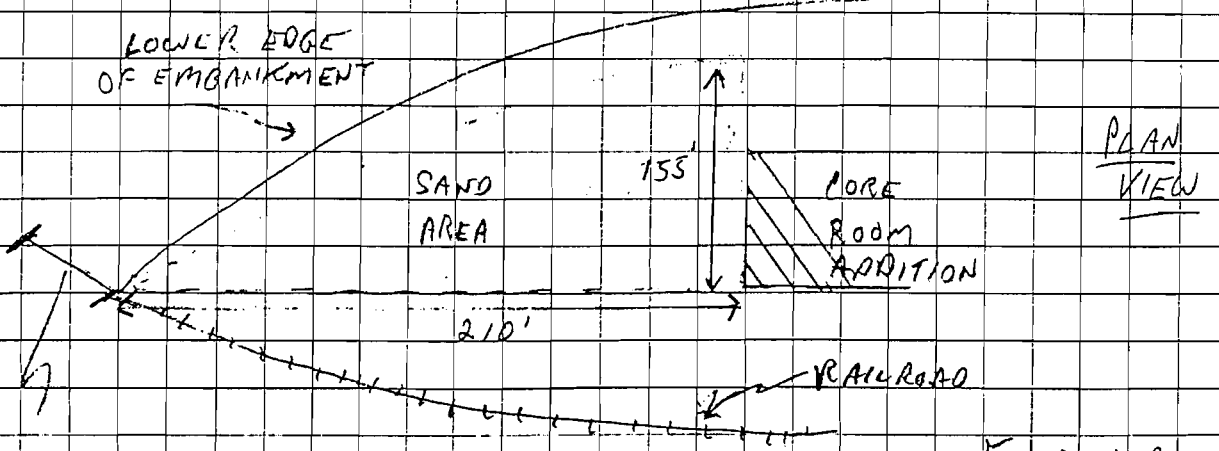
| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JW 3 29/02 | Initials: MMG 4/3/02 |
| | Initials: / / | Initials: / / |

4. WEST END SAND VOLUME ESTIMATE

⇒ TEST PIT WEST OF BUILDING SHOWS SAND EXTENDS TO AT LEAST 11' BELOW GRADE.

⇒ SAND EXTENDS FROM BUILDING (CORE ROOM ADDITION) TO RAILROAD BRIDGE. (210')

⇒ SAND EXTENDS PART WAY DOWN EMBANKMENT. ASSUME SAND IS PRESENT 1/2 WAY DOWN BANKING




PLAN VIEW

FIGURE 4-A

⇒ ASSUME SAND WAS PLACED ON TO NATIVE SLOPE.

⇒ SAND MOUNDED SIGNIFICANTLY ABOVE GRADE AT TOP OF EMBANKMENT.

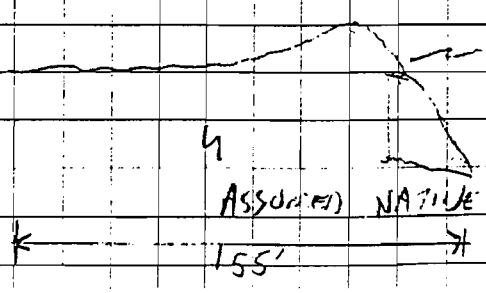



FIGURE 4-B

F0350793

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**General Computation Sheet**

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 10 of 14 | Project No. |

Name of Project DISTRICT FACILITY PHASE II System

Subject WEST END SAND VOLUME ESTIMATE (CONT'D)

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: JN 3/8/02 | Initials: MMG 4/3/02 |
| | Initials: / / | Initials: / / |

4. (CONTINUED)

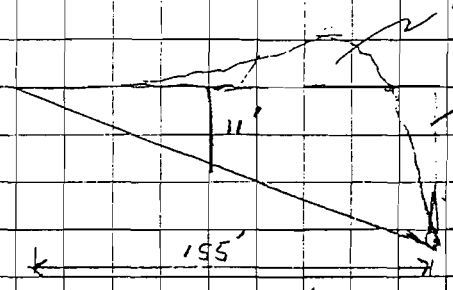


FIGURE 4-C

⇒ IF FILL IS 11' THICK NEAR MIDDLE OF BUILDING'S WEST END, ASSUME IT IS SLIGHTLY TAPERED AT TOP OF ESCARPMENT

⇒ ASSUME SAND PROFILE IS TRIANGULAR; SAND MOUNDING ABOVE GRADE ON RIDGE COMPENSATES FOR LACK OF SAND AT TOE OF SLOPE (AREA Q EQUALS AREA R IN FIGURE 4-C.

⇒ TOTAL VOLUME OF A TRIANGULAR CROSS-SECTION AND RECTANGULAR TOP:

$$V_T = \left[\tfrac{1}{2}(155' \cdot 25') \cdot 210'\right]$$

⇒ OVERALL AREA IS TRIANGULAR AS SHOWN IN FIGURE 4-A. AREA IS THUS ½ OF THE RECTANGULARLY-CALCULATED AREA

$$V_T = \left[\left(\tfrac{1}{2}(155' \cdot 25')\right) \cdot 210'\right] \tfrac{1}{2}$$

$V_T = 201,437\ ft^3$

$V_T = 7535\ yd^3$

ASSUMING 15% CONTINGENCY 8,665 $yd^3$

F0350793

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# General Computation Sheet

| | |
|---|---|
| Calculation Set No. | |
| Preliminary | ☐ |
| Final | ☒ |
| Void | ☐ |
| Sheet 11 of 11 | Project No. |

Name of Project Diisadier Foundry Phase II System

Subject Total Volume Estimate Summation

| Rev. | Completed By | Checked By |
|---|---|---|
| ☒ | Initials: [illegible] 3 2002 | Initials: MM 6/13/0 |
| | Initials: / / | Initials: / / |

SUMMARY OF TOTAL VOLUME ESTIMATES

1A. SOUTHERN SAND PILE: 218 $yd^3$

1B. NORTHERN SAND PILE: 107 $yd^3$

1C. CLEANING BUILDING PILE: 83 $yd^3$

TOTAL PILED VOLUME 408 $yd^3$

2. EMBANKMENTS ON EASTERN SIDE OF SITE

2A: WESTERN EMBANKMENT, EAST OF CLEANING BUILDING 313 $yd^3$

2B: EASTERN EMBANKMENT, EAST END OF SITE: 218 $yd^3$

3. NORTHERN EMBANKMENT:

3A: MAIN BUILDING: 533 $yd^3$

3B CORE ROOM ADDITION: 254 $yd^3$

3C: MOUND 40 $yd^3$

4. WEST END: 8,665 $yd^3$

⇒ TOTAL MOLDING SAND VOLUME ESTIMATE, INCLUDING A

15% CONTINGENCY: 10,431 $yd^3$

ROUND TO 10,450 $yd^3$

# D Data Usability Summary Report

# Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429
Facsimile 518-251-4428

March 4, 2002

Jon Nickerson
Ecology & Environment
368 Pleasantview Dr.
Lancaster, NY 14086

RE: Data Usability Summary Report for Dussault Foundry Data Packages
E&E Laboratories SDG Nos. 0112041, 0112046, and 0112047

Dear Mr. Nickerson:

Review has been completed for the data packages generated by Ecology & Environment Laboratories which pertain to samples collected 12/04/01 and 12/05/01 at the Dussault Foundry site, and received at the laboratory the same day as collection. The samples were processed for various combinations of volatiles (some also for isopropanol), semivolatiles, PCBs, TAL metals, and total phenols by USEPA CLP methodologies. Field and trip blanks, and sample matrix spikes were also processed for certain of the analytes. The ICP metals analyses were subcontracted to STL-Pittsburgh.

The data packages submitted contained full deliverables for validation, but this usability report is generated from review of the summary form information, with limited review of sample raw data, and some review of associated QC raw data. Full validation has not been performed. However, the reported summary tables have been reviewed for application of validation qualifiers, per the USEPA Region 2 validation SOPs and the USEPA National Functional Guidelines for Data Review, as affects the usability of the sample data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Field Duplicate Correlation
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Instrumental Tunes
* Calibration Standards
* Instrument IDLs

Those items listed above which show deficiency are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR level review.

**In summary**, most sample analyte values/reporting limits are usable as reported, or with minor qualification as estimated ("J" qualifier) due to typical matrix effects or processing, or edit to nondetection due to consideration of the detection as contamination. No serious data gaps were observed.

Copies of the laboratory case narrative and laboratory NYSDEC Sample Analytical Requirement Summary Form are attached to this text, and should be reviewed in conjunction with this report. Also enclosed are red-ink edited sample report Forms 1, reflecting the following edits and qualifications:

The following text discusses quality issues of concern.

## General

The PCB result for sample DF-SS01-SO (lab ID 0112046-06) was reported as DF-SS02-SO (there is a different sample with that ID). The report form attached has been corrected.

No report Form 1 was provided for the mercury result for sample DF-SUB03-SD. The result is 0.09 B mg/kg.

Accuracy and precision determinations were on project samples for soil and aqueous metals, soil semivolatiles, and medium level volatiles. Results were generally acceptable, with the exception of some metals analytes (discussed below).

Field duplicate correlation was evaluated for the following:

| | |
|---|---|
| DF-SUMP-WO | --PCBs and Metals |
| DF-RR02-SO | --Semivolatiles |
| DF-MS04-SO | --Semivolatiles, Metals, Phenols |
| DF-AST1-SO | --Volatiles |
| DF-SUB03-SO | --Volatiles, PCBs, Metals, Phenols |
| DF-SED01-DO | --Semivolaties and PCBs |

All correlations were within validation guidelines except those for iron, chromium, and copper for DF-SUMP-WO, which showed variances exceeding +-CRDL/50%RPD. Results for those three analytes in that aqueous sample and its field duplicate are qualified estimated ("J").

A rinse blank was analyzed for PCBs, TAL metals, and total phenols. It showed a detection for copper exceeding the CRDL, and results for copper in the following samples are therefore considered contamination, and edited to nondetection at the originally reported concentration, reflecting elevated reporting limits for that analyte. Affected samples are DF-MS02-S0, DF-RW01-SO, DF-BK01-SO, DF-BK02-SO, and DF-BK03-SO.

## Data Completeness

Pesticides were reported for the samples processed for PCBs. The pesticides are processed with the PCBs, but the results were not requested and are not undergoing the DUSR review. The data underwent a preliminary review which indicates that most of the reported pesticide detections reflect matrix interference, and would be edited to nondetection or considered tentative in identification following validation review.

The PCB analysis request for sample DF-SUB03-SO followed sample receipt.

No signature was present on the laboratory Metals Cover Page submitted with the metals data package.

## Volatiles by OLM04.2

The isopropanol processing was conducted by evaluation of the Tentatively Identified Compounds (TICs) in the sample, without associated standard QC. This allows a qualitative evaluation with the mass spectrum, but no absolute verification of identification by retention time. Of more significant concern, however, is that isopropanol purges very poorly, and the resulting high detection limit involved using this method makes a quantitative evaluation inappropriate. The results are reported with the assumption of similar response to the TCL analytes (method involves a response factor of 1). There is no reporting limit information for that analyte, and the reported detected values are to be considered as having an extreme low bias, possibly orders of magnitude. The result should have been qualified as "N" by the laboratory (for tentative identification).

The TIC reported as "unknown" in the dilution analysis of DF-AST1-SO appears to be isopropanol, as identified in other samples.

Sample DF-RW01-SO showed very slightly outlying responses for one internal standard (49%, below 50%) and one surrogate standard (139%, above 138%). Results for the twenty analytes associated with d5-chlorobenzene in that sample have been qualified estimated, but are not considered as having a significant bias.

Other surrogate and internal standard responses, sample analysis holding times, and instrumental tunes were acceptable. Blanks showed no contamination.

Sample DF-AST1-SO was processed at medium level due to very high acetone concentration, as allowable by analysis protocol. Reporting limits for the other analytes are therefore elevated well above those of the low level procedure.

Results for analytes initially reported with the "E" flag are derived from the dilution analyses of the samples.

Calibration standard responses were also acceptable, not affecting sample reported results, with the exception of that for acetone (78%D and 43%D) associated with the soil samples in SDG 0112046 and sample DF-AST1-SO. Results for acetone in those four samples are qualified estimated ("J").

Matrix spikes of DF-AST1-SD at medium level were acceptable. No low level soil or aqueous sample matrix spikes or batch QC were reported. Matrix Spiked Blanks (MSBs) showed acceptable recovery, but the project sample matrix has not been evaluated.

## Semivolatile Analyses by OLM04.2

Samples DF-SED01-DO and DF-SED01-DD exhibited low internal standard d12-perylene recoveries. The seven associated analyte results are therefore qualified as estimated in both samples.

Detected results for the seven analytes associated with d12-perylene are qualified estimated in the following samples due to elevated response of that internal standard: DF-RW02-SO, DF-BK03-SO, DF-BK01-SO, DF-BK02-SO, DF-RR02-SO, DF-RR02-SD, and DF-MS04-SO. In all cases, the initial analysis was preferred.

Detections of bis(2-ethylhexyl)phthalate in the samples which are below the sample CRDL are edited to nondetection and considered contamination due to low level presence in the associated method blank. The sample results should have been qualified as "B" by the laboratory.

Results for analytes initially reported with the "E" flag are derived from the dilution analyses of the samples.

The result for benzaldehyde in DF-BK02-SO is qualified as tentative in identification ("NJ") due to poor spectral quality.

Surrogate standard responses, holding times, and instrumental tunes were acceptable.

Soil matrix spikes of DF-MS01-SO were acceptable. No aqueous matrix spikes were performed. MSB recoveries were acceptable.

Calibration standard responses were acceptable; no qualification is made for nondetected analytes showing elevated standard response.

## PCBs by OLM04.2 TEXT

Please see the discussed earlier in this report regarding pesticide reported results.

The sediment samples DF-SED01-DO and DF-SED01-DD showed extreme matrix interference, and no recovery of the surrogate DCB on either of two columns. One also showed no recovery of surrogate TCX on one column. Therefore, results reporting nondetection in these two samples are rejected, and not usable ("R"). The detections of Aroclor 1242 in the samples are qualified estimated ("J").

The method blank showed detection of Aroclor 1254 at about one half the CRDL. Detected results for that analyte in the samples which are below five times the blank level are considered contamination, and edited to nondetection.

Results for DF-SS02-SO are qualified estimated ("UJ"), with a possible low bias, due to outlying surrogate recoveries.

Holding times and calibration standards were acceptable. No sample matrix spikes were processed. MSBs showed acceptable recoveries.

Independent verification of the reported nondetections is not totally possible with the instrumental output provided. Full validation would require unedited integration output, and/or more detailed elution time scaling of the chromatogram. As is, the nondetected results are dependent on analyst interpretation. Detected results are well documented.

## Metals/CN Analyses by ILM04.0

No report Form 1 was provided for the mercury result of sample DF-SUB03-SD. The result is 0.09 B mg/kg.

The matrix spikes of DF-MS01-SO produced low recoveries for antimony, copper, manganese, and selenium (59% to 74%). Results for these four analytes in the associated soil project samples are considered estimated ("J" and "UJ"). Duplicate correlations were acceptable, as were the aqueous matrix spike/duplicate of ICP elements in DF-SUMP1-WD, and mercury in DF-MS02-SO and DF-BK04-WR. Some of the duplicate correlation %RPD numbers were inaccurately reported on the summary form for DF-SUMP1-WD.

The mercury recovered at 56% in DF-RW02-SO, and results for mercury in the associated samples are therefore qualified estimated ("J").

Due to an elevated recovery in the associated CRI standard (150%), detected mercury results below five times the CRDL in samples in SDG 0112046 are qualified estimated, with a possible high bias. Mercury results in the following samples are qualified estimated as well, due to lack of CRI standard evaluation. Results are not rejected in these samples due to the fact that a standard at the same concentration was run as part of the initial calibration 20 minutes before the samples. Affected samples are DF-MS01-SO, DF-MS02-SO, DF-MS03-SO, DF-MS04-SD, and DF-RW01-SO.

ICP serial dilution correlations for aqueous sample DF-SUMP1-WD were within recommended range. Those for DF-MW01-SO showed elevated correlation for potassium (28%RPD), and results for that analyte are therefore qualified estimated ("J") in the project soil samples.

## Total Phenols

Matrix spike and duplicate evaluations were performed on DF-MS02-SO, DF-SUB09-SO, and DF-SUB10-SO, and showed acceptable accuracy and precision for the latter two. That for DF-SUB10-SO showed recovery of 53%, and duplicate correlation of 75%RPD. The result for phenols in that sample is qualified estimated ("J"). The recovery would have been acceptable if calculated against the sample duplicate, implying possible nonhomogeneity.

Blanks showed no contamination, and random QC review showed acceptable results.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND
ANALYTICAL REQUIREMENT SUMMARY

| Customer Sample Code | Laboratory Sample Code | Analytical Requirements | | | | | |
|---|---|---|---|---|---|---|---|
| | | *VOA GC/MS Method # | *BNA GC/MS Method # | *VOA GC Method # | *Pest PCBs Method # | *Metals | *Other Phenol |
| DF-SUMP1-WD | 0112041-01 | | | | OLM04.2 | ILM04.1 | 9065 |
| DF-SUMP2-WD | 02 | | | | | | |
| DF-SUMP3-WD | 03 | | | | | | |
| DF-SUMP4-WD | 04 | | | | | | |
| DF-SUMP1-WD | 05 | | | | | | |
| DF-MS01-SO | 06 | | OLM04.2 | | | ILM04.1 | |
| DF-MS02-SO | 07 | | | | | | |
| DF-MS03-SO | 08 | | | | | | |
| DF-MS04-SO | 09 | | | | | | |
| DF-MS04-SD | 10 | | | | | | |
| DF-AST1-SO | 11 | OLM04.2 | | | | | |
| DF-AST1-SD | 12 | OLM04.2 | | | | | |
| DF-RR01-SO | 13 | | OLM04.2 | | | | |
| DF-RR02-SO | 14 | | | | | | |
| DF-RR03-SO | 15 | | | | | | |
| DF-RR02-SD | 16 | | | | | | |
| DF-RW01-SO | 17 | OLM04.2 | | | | ILM04.1 | |
| DF-TB01-WT | 0112047-01 | | | | | | |
| DF-SUMP1-WD | 02 | | | | | | |
| DF-SUMP1-WD | 03 | | | | | | |
| DF-SUMP2-WD | 04 | | | | | | |
| DF-SUMP3-WD | 05 | | | | | | |
| DF-SUMP4-WD | 06 | | | | | | |
| DF-BK04-WR | 07 | | | | OLM04.2 | ILM04.1 | 9065 |
| | | 1/18/02 | | | | | |

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND
ANALYTICAL REQUIREMENT SUMMARY

| Customer Sample Code | Laboratory Sample Code | Analytical Requirements | | | | | |
|---|---|---|---|---|---|---|---|
| | | *VOA GC/MS Method # | *BNA GC/MS Method # | *VOA GC Method # | *Pest PCBs Method # | *Metals | *Other Phenols |
| DF-RW02-SO | 0112046-01 | OLM04.2 | OLM04.2 | | OLM04.2 | ILM04.1 | |
| DF-SW03-SD | 02 | OLM04.2 | | | OLM04.2 | ILM04.1 | 9065 |
| DF-RB04-SO | 03 | | OLM04.2 | | | | |
| DF-SED01-DO | 04 | | " | | OLM04.2 | | |
| DF-SED01-DD | 05 | | " | | " | | |
| DF-SS01-SO | 06 | | | | " | | |
| DF-BK01-SO | 07 | | OLM04.2 | | " | ILM04.1 | 9065 |
| DF-BK02-SO | 08 | | " | | " | " | " |
| DF-BK03-SO | 09 | | " | | " | " | " |
| DF-SW01-SO | 10 | | | | | | |
| DF-SW02-SO | 11 | | | | | | |
| DF-SW03-SO | 12 | OLM04.2 | | | OLM04.2 | ILM04.1 | |
| DF-SW04-SO | 13 | | | | | ILM04.1 | |
| DF-SW05-SO | 14 | OLM04.2 | | | | | |
| DF-SW06-SO | 15 | | | | | | |
| DF-SW07-SO | 16 | | | | OLM04.2 | ILM04.1 | |
| DF-SW08-SO | 17 | | | | | ILM04.1 | |
| DF-SW09-SO | 18 | | | | | | |
| DF-SW10-SO | 19 | | | | | | " |
| DF-SS02-SO | 20 | | | | OLM04.2 | | |

Ecology and Environment, Inc.
Analytical Services Center
Lancaster, New York 14086
Phone: (716) 685-8080

# Laboratory Results

NYS ELAP ID#: 10486

CLIENT: E and E Buffalo Office
Project: Dussault Foundry
Lab Order: 0112041

## CASE NARRATIVE

Included in this report are results of the volatile, semivolatile(BNA), pesticide/PCB, and phenol analysis. Samples were sent to STL-Pittsburgh for metals analysis. Results will be submitted under separate cover.

GCMS VOLATILES
A DB 624 column and a trap packed with OV-1, Tenax, silica gel and activated charcoal was used for the volatile analysis.

Sample analysis

All aqueous volatile samples were determined to be at a pH of approximately 7 su.
All samples were analyzed within hold time.

Samples DF-AST1-SO and AST1-SD were searched for the presence of 2-propanol. It was detected in both samples and is reported as a tentatively identified compounds.

Samples DF-AST1-SO and DF-AST1-SD were analyzed using the medium level technique due to the level of acetone present. The samples also required reanalysis at secondary dilutions in order for the acetone levels to fall within calibrated range.

Calibration and Tunes

The %D value for 1,1-dichloroethene exceeded 25% for the 12/7 continuing calibration standard (J0714). The response factor for trichloroethene was below 0.30 for the 12/11 calibration standard (J0812). No corrective action was required. All other initial and continuing calibrations were acceptable.
Manual integrations were not required.

QC

All surrogate recoveries were within acceptable limits except for sample DF-RW01-SO which yielded high tolunen-d8 recovery. The sample was reanalyzed with similar recovery indicating a matrix effect. Results of both analyses are included in this report.
All blank analyses were acceptable.
All matrix spike/spike duplicate (MS/MSD) recoveries and RPD values were acceptable.
All laboratory control sample (LCS) recoveries were acceptable.
All internal standard area responses were acceptable except DF-RW01-SO which had low chlorobenzene-d5 response. Response was similar in the reanalysis indicating a matrix effect. Results of both analyses are included in this report.

GCMS SEMIVOLATILES
A RESTEK (Rtx-5ms) column, which is 30-m long, 0.25-mm wide, and has a 0.5-micron film thickness, was

used for the semivolatile analyses. The column contains 5% diphenyl and 95% dimethylpolysiloxane.

All samples were extracted and analyzed within hold times.

Samples DF-RR02-SD and DF-RR02-SO were analyzed at four and five-fold dilutions due to matrix.

Calibration and Tunes

The initial and continuing calibrations were acceptable.

QC

All surrogate recoveries were within acceptable limits.

The soil blank analysis was acceptable.

All matrix spike/spike duplicate (MS/MSD) recoveries and RPD values were acceptable.

A matrix spike blank was extracted and all spike and surrogate recoveries were within acceptable limits.

Samples DF-MS04-SO, DF-RR02-SD, DF-RR02-SO, and DF-RW01-SO had high internal standard area recoveries of perylene-d12. They were reanalyzed with similar results, confirming a matrix effect. Both sets of data are reported.

No manual integrations were required.

The tentatively identified alkanes are reported in the Alkane Narrative Report.

GC SEMIVOLATILES
PESTICIDE/PCB

The columns used for analysis were an RTX-5 (column 1) and an RTX-35 (column 2), both 30 meters long and 0.53 mm in diameter, with a 1.0 um film thickness. A 2-ul injection was performed on all samples, QC, and standards.

Sample Analysis

All samples were extracted and analyzed within hold time.

The soil samples were analyzed in two separate run sequences. In both sequences, calibration criteria was exceeded due to the matrix of the samples. The most compliant of these analyses (the second analysis) is included in this report. Also included in this data package, is the raw data for both calibration standards and samples for the remaining unreported sequence.

Calibrations

| | |
|---|---|
| CLIENT: | E and E Buffalo Office |
| Project: | Dussault Foundry |
| Lab Order: | 0112041 |

# CASE NARRATIVE

All initial and continuing calibrations were acceptable except for delta- BHC in continuing calibration standard INDBMA3, and 4,4'-DDT in continuing calibration standard INDAMA4, both on column 1. All continuing calibrations were within acceptable limits on column 2.

Manual integrations were not required.

QC

All surrogate recoveries were within acceptable limits except for a slightly low recovery of the surrogate TCMX on column 1 in sample DF-RW01-SO.

All blank analyses were acceptable.

All laboratory control sample (LCS) recoveries were acceptable.

GENERAL ANALYTICAL CHEMISTRY

Sample Analysis

All samples were analyzed within hold time.

Soil sample DF-SUMP1-WD required analysis at a two-fold dilution for phenol due to the concentration present in the native sample.

QC

All calibration and preparation blank analyses were acceptable.

All matrix spike/matrix duplicates were acceptable except for the following:
1. The matrix duplicate analysis of soil sample DF-SUMP1-WO exceeded the RPD criteria for phenol.
2. The matrix spike analysis of soil sample DF-SUMP1-WO had a slightly low spike recovery for phenol at 72% (lower limit is 75%).

All laboratory control sample (LCS) recoveries were acceptable.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Barbara Krajewski

Barbara Krajewski
Project Manager
January 18, 2002

Ecology and Environment, Inc.
Analytical Services Center
Lancaster, New York 14086
Phone: (716) 685-8080

# Laboratory Results

NYS ELAP ID#: 10486

CLIENT: E and E Buffalo Office
Project: Dussault Foundry
Lab Order: 0112046

## CASE NARRATIVE

Included in this report are results of the volatile, semivolatile(BNA), pesticide/PCB, and phenol analysis. Samples were sent to STL-Pittsburgh for metals analysis. Results will be submitted under separate cover.

GCMS VOLATILES
A DB624 column from J&W that is 30-m long, 0.53 mm wide, and has a 3-um film thickness was used for the volatile analyses. A 30-cm TEKMAR #5 Trap was used for the volatile analyses consisting of approximately 1 cm of OV-1 packing, approximately 8 cm of Tenax, approximately 8 cm of silica gel, and approximately 8 cm of activated charcoal.

Sample Analysis

All samples were analyzed within hold time.

Calibration and Tunes

The %D value for 1,1-dichloroethene exceeded 25% for the 12/7/01 continuing calibration standard (J0714). No corrective action was required. All other initial and continuing calibrations were acceptable.

QC
All surrogate recoveries were within acceptable limits.
All blank analyses were acceptable.
All laboratory control sample (LCS) recoveries were acceptable.
All internal standard area responses were acceptable.

GCMS SEMIVOLATILES
A RESTEK (Rtx-5ms) column, which is 30-m long, 0.25-mm wide, and has a 0.5-micron film thickness, was used for the semivolatile analyses. The column contains 5% diphenyl and 95% dimethylpolysiloxane.

Sample Analysis

All samples were extracted and analyzed within hold time.

The level of fluoroanthene exceeded the calibrated range in sample DF-BK-SO. The sample was reanalyzed at a 2-fold dilution. Results of both analyses are included in this report.

Samples DF-SED01-DO, DF-SED01-DD, and DF-BK03-SO were initially analyzed at secondary dilutions based on physical appearance. High concentrations of hydrocarbons and some target compounds were detected in the samples. They were not reanalyzed at a lesser dilution.

Calibration and Tunes

| | |
|---|---|
| CLIENT: | E and E Buffalo Office |
| Project: | Dussault Foundry |
| Lab Order: | 0112046 |

# CASE NARRATIVE

All initial and continuing calibrations were acceptable.

QC

All surrogate recoveries were within acceptable limits.

Method blank analysis was acceptable.

A spiked blank was extracted and analyzed as a measure of quality control. All recoveries were within acceptable limits.

Internal standard area responses for all samples except DF-RR04-SO fell outside of the acceptable range. The samples were reanalyzed with similar responses confirming a matrix effect.

Due to a pressure problem, the reanalysis of sample DF-BK02-SO terminated before the elution of benzo(g,h,i)perylene. As analysis was only required to substantiate a matrix effect through internal standard responses, no corrective action was taken.

No manual integrations were required.

The tentatively identified alkanes are reported in the Alkane Narrative Report.

GC SEMIVOLATILES
PESTICIDE/PCB
The columns used for analysis were an RTX-5 (column 1) and an RTX-35 (column 2), both 30 meters long and 0.53 mm in diameter, with a 1.0 um film thickness. A 2-ul injection was performed on all samples, QC, and standards.

Sample Analysis

All samples were extracted and analyzed within hold time.

A secondary dilution was performed on samples DF-BK03-SO and DF-SS02-SO based on the level of target compounds present in the native extract.

The soil samples were analyzed in two separate run sequences. In both sequences, calibration criteria was exceeded due to the matrix of the samples. The most compliant of these analyses (the second analysis) is included in this report. Also included in this data package, is the raw data for both calibration standards and samples for the remaining unreported sequence.

Calibrations

All initial and continuing calibrations were acceptable except for delta- BHC in continuing calibration standard INDBMA3, and 4,4'-DDT in continuing calibration standard INDAMA4, both on column 1. All continuing calibrations were within acceptable limits on column 2.

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|---|---|
| CLIENT: | E and E Buffalo Office |
| Project: | Dussault Foundry |
| Lab Order: | 0112046 |

# CASE NARRATIVE

Manual integrations were not required.

QC

All surrogate recoveries were within acceptable limits except for recovery of DCB in samples DF-BK01-SO, DF-BK03-SO, DF-SED01-DD, DF-SED01-DO, and DF-SS02-SO, and recovery of TCMX in sample DF-SED01-DO.

All blank analyses were acceptable.

All laboratory control sample (LCS) recoveries were acceptable.

GENERAL ANALYTICAL CHEMISTRY

Sample Analysis

All samples were analyzed within hold time.

QC

All preparation blank analyses were acceptable.

All matrix spike/matrix duplicates were acceptable except for the following:
1. The matrix duplicate analysis of soil sample DF-SUB10-SO exceeded the RPD criteria for phenol.
2. The matrix spike analysis of soil sample DF-SUB10-SO had a low spike recovery for phenol at 53% (lower limit is 75%).

All laboratory control sample (LCS) recoveries were acceptable.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Barbara Krajewski

Barbara Krajewski
Project Manager
January 18, 2002

CASE NARRATIVE
ECOLOGY & ENVIRONMENT
Dussault Foundry
STL Lot# C2A160233

**Sample Receiving:**
The samples were received at STL Pittsburgh on January 16, 2002 in good condition and within the proper cooler temperature.

**Metals:**
Sample DF-RW02-SO was over the instrument's linear range for zinc and required a dilution.

For the matrix spike of sample DF-MS01-SO, lead and iron recoveries were not calculated due to the concentration of analyte in the sample being >4 times the concentration of spike added.

The matrix spike of sample DF-MS01-SO recovered outside of the control limits for antimony, copper, manganese, and selenium. All associated results are flagged with an "N" qualifier.

For the matrix spike of sample DF-SUMP1-WD, the lead recovery was not calculated due to the concentration of analyte in the sample being >4 times the concentration of spike added.

The relative percent difference between sample DF-MS01-SO and the duplicate digestion of this sample was outside of the control limits for nickel. All associated results are flagged with an "*" qualifier.

The serial dilution percent difference was outside of the control limits for potassium. All associated results are flagged with an "E" qualifier.

**General Chemistry:**
The client supplied the percent solids results.

Ecology and Environment, Inc.
Analytical Services Center
Lancaster, New York 14086
Phone: (716) 685-8080

# Laboratory Results

NYS ELAP ID#: 10486

CLIENT: E and E Buffalo Office
Project: Dussault Foundry
Lab Order: 0112041; 0112046; 0112047

## CASE NARRATIVE

Included in this report are results of the metals analysis. Mercury analysis was performed at the Ecology and Environment ASC. The remaining 22 TAL metals were analyzed by STL-Pittsburgh. Results of the volatile, semivolatile(BNA), pesticide/PCB, and phenol analysis were submitted in a report dated January 18, 2002.

Narrative notes regarding the analysis of the 22 TAL metals from STL are summarized separately.

MERCURY

Mercury results for samples DF-BK01-SO, DF-BK02-SO, DF-BK03-SO, DF-RW02-SO, DF-SUB03-SO, DF-SUB04-SO, DF-SUB07-SO, and DF-SUB08-SO are flagged "N" based on low recovery for the matrix spike analysis of sample DF-RW02-SO. All laboratory control sample recoveries were acceptable. No corrective action was required.

No reading was obtained for the CRA standard analyzed at 14:39 on 12/10/01. It is suspected that the standard was not properly introduced into the instrument. No corrective action was required.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Barbara Krajewski
Project Manager
January 25, 2002