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REMOVAL ACTION REPORT

HORTON SALES DEVELOPMENT SITE
1870 PIEDMONT HIGHWAY
PIEDMONT, SOUTH CAROLINA
GREENVILLE COUNTY

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ASSESSMENT & REMEDIATION

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Removal Action Report

Horton Sales Development Site
1870 Piedmont Highway
Piedmont, South Carolina
Greenville County

July 4, 2008

Prepared For:

South Carolina Department of Health & Environmental Control
State Remediation Section
Bureau of Land & Waste Management
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Signature Page

This document entitled "Removal Action Report", has been prepared for the South Carolina Department of Health and Environmental Control to describe activities required to properly remove containers and stored wastes from the Horton Sales Development Site located in Piedmont, South Carolina. This report was prepared in order to document the activities required to address the release or threat of a release of hazardous substances at the Piedmont Highway property. The Removal Action Report has been prepared under the direct supervision of William B. Dunnagan, Jr., P.G.

KLEEN SITES GEOSERVICES, INC.

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Seal

Removal Action Report

Horton Sales Development Site
Piedmont, South Carolina

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LIST OF ACRONYMS

ASTM	American Society for Testing and Materials
bls	below land surface
BDL	below detection level
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
COPC	chemical of potential concern
CSM	conceptual site model
CWT	centralized waste treatment
DAF	dilution attenuation factor
DO	dissolved oxygen
DQCR	Daily Quality Control Report
DQO	Data Quality Objective
DRO	diesel range organics
ET	exposure time
FID	flame ionization detector
FM	field manager
ft	foot or feet
ft/day	feet per day
ft/msl	feet above mean sea level
HI	hazard index
HQ	hazard quotient
HSA	hollow stem augers
HSO	Health and Safety officer
IBCs	intermediate bulk containers
IDW	investigation-derived waste
IRA	interim removal action
KSG	Kleen Sites Geoservices, Inc.
MCL	maximum contaminant level
MDL	method detection level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
NES	NuWay Environmental Services, Inc.
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
PM	project manager
PPE	personal protective equipment
ppm	parts per million
QA	Quality Assurance
QC	Quality Control
RBC	risk-based concentration

LIST OF ACRONYMS (continued)

RCRA	Resource Conservation and Recovery Act
RGO	Remedial Goal Option
RL	remediation level
SA	surface area
SCDHEC	South Carolina Department of Health and Environmental Control
SQL	sample quantitation limit
SS SSL	site-specific soil screening level
SSHP	Site-Specific Health and Safety Plan
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TM	task manager
TOC	total organic compound
TRPH	total recoverable petroleum hydrocarbons
UF	uncertainty factor
ug/L	micrograms per liter
USCS	Unified Soil Classification System
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
VOPAK	Vopak Logistics Services USA – Piedmont LLC

Section 1.0
Introduction

SECTION 1.0

INTRODUCTION

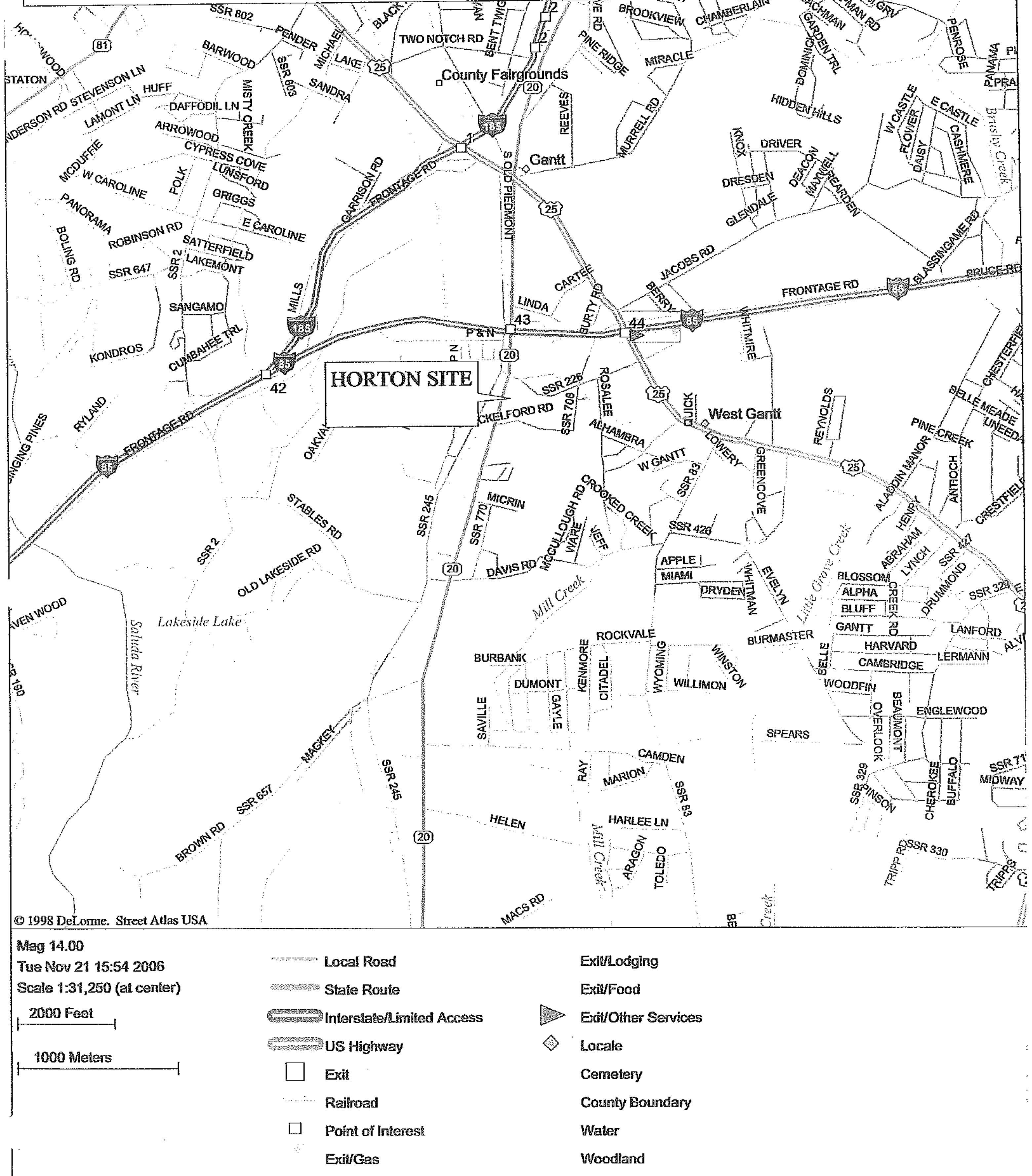
Kleen Sites Geoservices, Inc. (KSG) and NuWay Environmental Services, Inc. (NES) have prepared this Removal Action Report to describe the procedures and methodologies that were implemented during removal of intermediate bulk containers (IBCs) from the Horton Sales Development Site (or the "Horton site") located at 1870 Piedmont Highway in Piedmont, South Carolina (see Figure 1-1). The Removal Action Report is organized into several sections that include the following:

- a description and history of the Horton site,
- a description of regional and site-specific geologic conditions,
- details of IBC removal activities,
- details of waste handling, transportation and disposal activities,
- a compilation of liquid and solid laboratory analytical data generated during the waste characterization process,
- a description of confirmation soil sampling and analysis activities, and
- removal action conclusions and recommendations.

Field activities began in December 2006 with the mobilization of personnel and equipment from NES to the Horton site. The existing covered concrete platform was used as the IBC processing area. Site personnel marked each container with a unique number that was used throughout waste handling, transportation and disposal activities. Initially, empty IBCs were taken to the processing area to be cut or crushed. This created more room for subsequent site activities. Waste characterization and removal for IBCs containing solids and/or liquids were performed in the processing area or inplace, depending on the condition of the container. Compatible wastes were stored onsite in bulk containers. Once properly permitted disposal facilities were identified for each waste stream, the bulk containers were transported offsite for final disposal. Empty IBC containers were also transported offsite for disposal.

Once all staged IBCs had been removed from the Horton site, surficial soils were inspected for areas of visual staining or other evidence of a release from previous site operations. In the event that stained areas were observed, soil samples were collected and submitted to a South Carolina certified laboratory for analysis. Soil removal and subsequent confirmation sampling activities were not necessary during this investigation. The results of the IBC removal action have been compiled into this Removal Action Report and are presented herein.

Figure 1-1: Site Location Map



Section 2.0
Background

SECTION 2.0

BACKGROUND

2.1 Site Location and Description

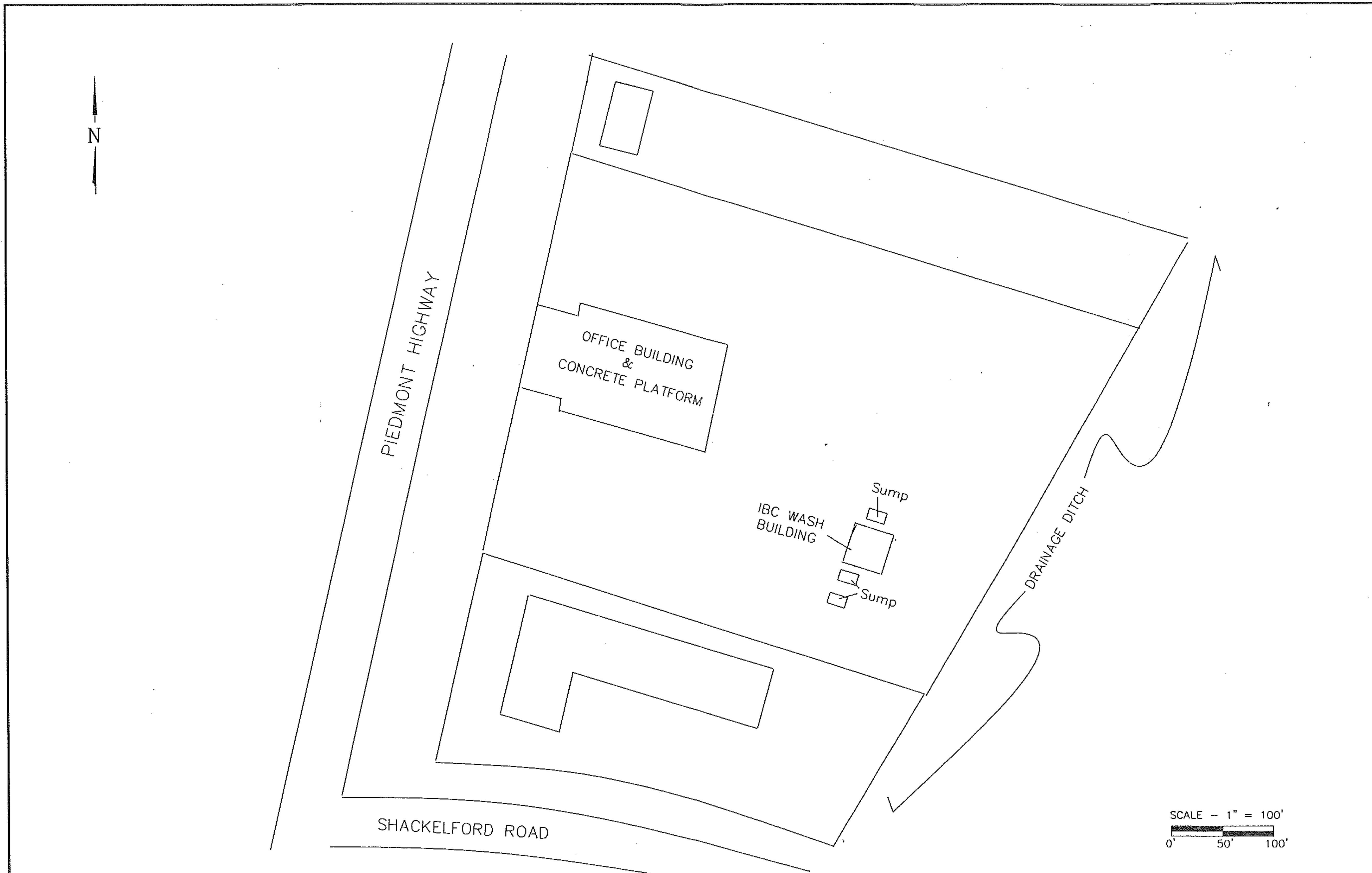
The Horton site is located at 1870 Piedmont Highway in Piedmont, Greenville County, South Carolina. The entire Horton site covers approximately 4.57 acres with most of the property previously being occupied by IBCs, the onsite building and the covered concrete platform structure. In many areas, IBCs were stacked 3 or 4 high across the property. As shown in Figure 2-1, the Horton site is bounded to the west by Piedmont Highway, to the north by a residential dwelling and to the west and south by commercial businesses.

The Horton site is located in an old trucking terminal in an area that is comprised of light industrial and commercial businesses and some residences. At the rear (eastern portion) of the property is a concrete block washhouse. This structure was previously used for removing waste from onsite IBCs and then cleaning the containers for resale. The headwaters of a creek and storm water drainage ditch flow behind the site through a wooded area and to the south into Mill Creek. The creek receives runoff from Piedmont Highway and from the adjacent properties. A storm water drain on the south side of the washhouse also drains to the creek through a concrete culvert pipe.

2.2 Site History

The Horton site operated as a container recycling business until November of 2006. Large chemical containers (commonly referred to as "totes", "intermediate bulk containers" or "IBCs") were received from off-site sources. Any remaining contents of the containers were emptied and the containers cleaned for reuse. Many of the IBCs recycled at the Horton site have reportedly been used for the shipment of textile dyes. Prior inspections at the subject property by personnel from the South Carolina Department of Health and Environmental Control (SCDHEC) noted potentially hazardous wastes spilling onto the ground from leaking containers.

According to facility personnel, IBCs were cleaned in the onsite washhouse. In general, any remaining product in the containers was emptied and the containers were then rinsed out. Bleach or other detergent was used to clean the interior of the containers. Waste from the container rinse operations reportedly flowed into floor drains and into one of three cleaning process water holding tanks (in-ground concrete tanks). Facility personnel stated that the waste would then either be discharged to the sanitary sewer or pumped back to a tanker truck for off-site disposal. The primary holding tank contained a stand pipe that prevented overfill of the tank. When the liquid level reached the top of the stand pipe, it reportedly drained into a creek behind the facility.



HORTON SALES
DEVELOPMENT SITE
1870 PIEDMONT HWY
GREENVILLE, SOUTH CAROLINA

FIGURE 2-1:
SITE LAYOUT MAP

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SITES
GEOSERVICES

D:\KSG\CAD\2006\06655\Fig 2-1 (soil)

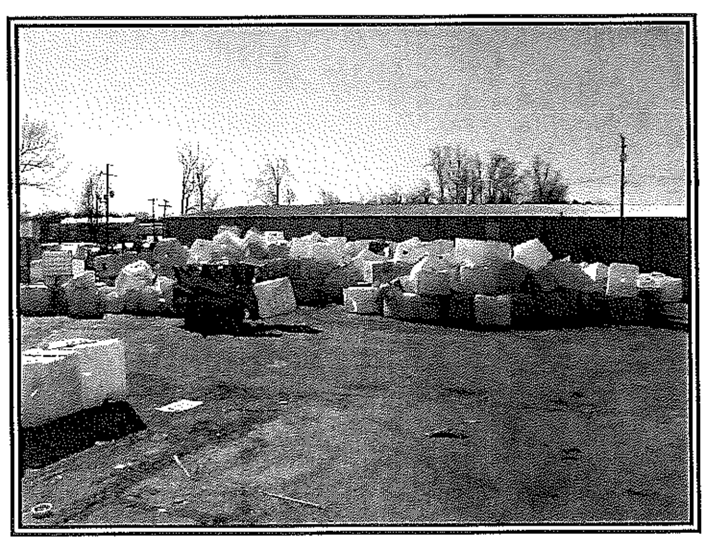
2.3 Previous Site Investigative Activities

The SCDHEC Division of Site Assessment and Remediation retained Earth Tech, Inc. (Earth Tech) to conduct an initial environmental assessment at the Horton site. Assessment activities were implemented to gather chemical data sufficient to determine whether hazardous substances or wastes were being stored on the subject property or released to the environment. Earth Tech personnel mobilized to the Horton site in July of 2003 to collect soil, surface water and waste samples. The samples were submitted to a South Carolina certified laboratory, Shealy Environmental Services, Inc. (SHEALY) for analysis. Data from the investigation was compiled within the Initial Site Assessment Report dated August 27, 2003.

Earth Tech personnel returned to the Horton site in December of 2005 and January of 2006 to conduct additional environmental assessment activities. Site activities were again implemented to gather chemical data sufficient for the SCDHEC to determine whether hazardous substances or wastes were being stored on the subject property or released to the environment. Soil, surface water and waste samples were collected and submitted to SHEALY for laboratory analysis. Data from the investigation was compiled within the Additional Site Assessment Report dated February 17, 2006.

2.4 Regulatory Status

The SCDHEC State Superfund Program determined it necessary to remove containers and stored material from the Horton site. Initially, it was estimated that over five thousand (5,000) containers, some containing hazardous substances, including organic chemical constituents were onsite. Many of these containers had been present since 1998.



Empty IBCs Scattered Across Horton Site

Section 3.0
Field IBC Removal

SECTION 3.0

FIELD IBC REMOVAL ACTIVITIES

3.1 Removal Action Objectives

Removal Action objectives at the Horton site were as follows:

- Each onsite IBC was assigned a unique tracking number;
- Information present on the containers was photographed and documented;
- Appropriate information was collected to create an IBC inventory database;
- Empty IBCs were transported offsite for disposal ;
- Solids and liquids in waste-containing IBCs were characterized for disposal;
- Consolidated solid and liquid wastes were transported offsite to permitted disposal facilities;
- A soils contamination assessment was implemented, and
- Data generated during the field effort was compiled into a Removal Action Report.

Detailed descriptions of the field procedures that were implemented to achieve the listed objectives are provided in the following sections.

3.2 Site Preparation

NES and KSG personnel and equipment mobilized to the Horton site in December 2006. Initially, a central processing area was established onsite. IBCs that were in transportable condition were moved to the central processing area so that the majority of site operations including waste characterization, waste removal, waste storage and container rinsing could be performed at one location. This procedure provided increased safety for onsite workers while minimizing the potential for incidental spillage of stored wastes during the IBC removal effort.

The existing covered concrete platform area was used as the central processing area. An office trailer was mobilized to the site and set up in close proximity to the central processing area. Large, portable decontamination units were positioned in the concrete platform area. Rinse water was collected within the decontamination units during IBC cleaning activities to minimize the potential for liquid and/or solid wastes to impact surrounding soils.

3.3 Container Documentation

One of the stated objectives of this removal action was to establish documentation for each container that was processed and ultimately transported offsite for final disposal. Once site preparation activities were completed, a unique number was assigned to each container. The number was placed on each container using a water-resistant marker. For each IBC, the following information was recorded during the documentation process:

- Condition of the container (transportable or nontransportable, empty or waste-containing),
- Photograph of each container where a label or other marking was present,
- Information on chemical manufacturer, if present,
- Information on chemical contents, if present (name, color, quantity, etc.), and
- Type and size of container (plastic, metal, etc)

During the Horton IBC removal project, the unique number assigned to each container was used to track the processing, transportation and disposal of both the IBC shell and inner contents.

3.4 Waste Handling Procedures

3.4.1 Empty IBC Processing

During a visit to the Horton site on October 27, 2006 by personnel from the SCDHEC, KSG and NES, it appeared that a significant number of onsite IBCs were empty. By initially processing and removing the visually empty containers from the site, the cluttered appearance of the property was reduced, improving access to remaining, waste-containing IBCs.

An all-terrain forklift was utilized to transport visually empty IBCs down to the central processing area. "Empty" was defined as containers with less than 2.5 centimeters (1 inch) of residue remaining on the bottom of the container. Each IBC was separated from the surrounding metal cage and the bottom pallet (if necessary). The metal cages and pallets were placed into separate staging areas, crushed and transported offsite for recycling.

Empty plastic containers were cut into pieces to significantly reduce the volume of each container thus making the transportation and disposal of the material more cost-effective. The plastic scrap was loaded into onsite trailers and transported to the Union County Landfill for final disposal.

3.4.2 Waste-Containing IBCs

Several different scenarios for removal of waste-containing IBCs were encountered depending on the condition of the container and the nature of the waste present. Figure 3-1 provides a general schematic presentation of the waste handling decision process that was used at the Horton site.

3.4.2.1 Waste Characterization of Unlabeled IBCs

Waste characterization of IBCs containing solids and / or liquids without labeling on the container presented one of the most technically challenging and potentially dangerous tasks associated with the waste removal project. Each unknown waste was evaluated to determine a hazardous vs. nonhazardous classification for handling, storage, transportation and disposal purposes. Using SCDHEC Code of Regulations 61-79.261 Subpart C to define the characteristics of a hazardous waste, the following criteria was evaluated on each unknown waste at the Horton site:

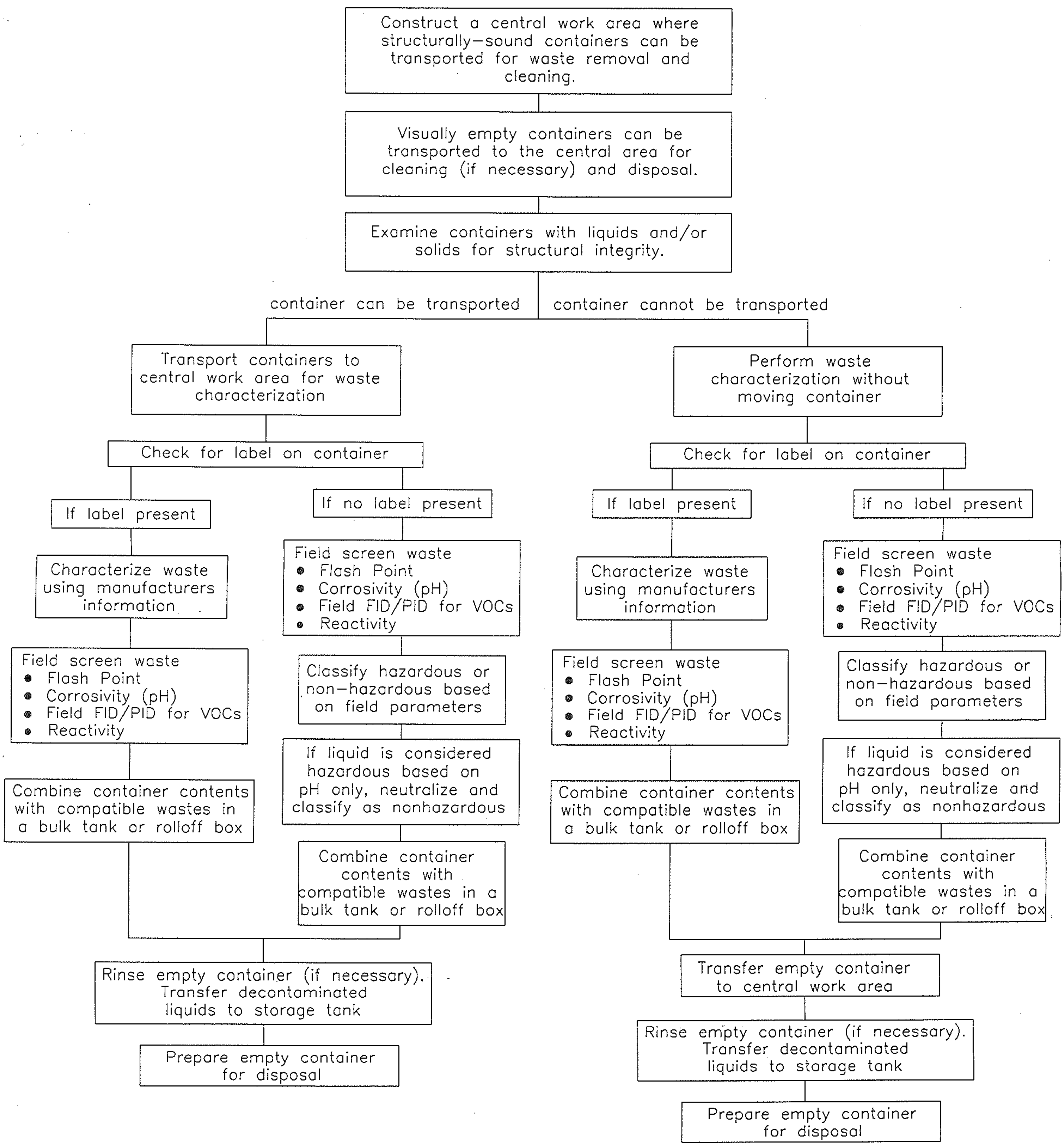
- Ignitability
- Corrosivity
- Reactivity
- Toxicity

Field testing was conducted to determine whether the unknown waste was classified as hazardous or nonhazardous for transportation and disposal purposes. Ignitability was initially checked using a Photoionization detector (PID). In the event that organic vapors were detected within a liquid-containing IBC at concentrations exceeding 500 ppm using a PID, a sample was submitted to SHEALY for flash point analysis. Any sample of unknown liquid with a flash point of less than 140 °F was classified as hazardous. Liquids with a flash point exceeding 140 °F were considered nonhazardous with respect to ignitability.

Corrosive liquids are defined as aqueous liquids having a pH less than or equal to 2 or greater than or equal to 12.5. A pH meter was used in the field to evaluate each unknown waste for corrosivity. Any unknown waste meeting the corrosivity criteria was transported to a separate "holding area". Toward the end of the project, liquids with a pH of less than 2 or greater than 12.5 were neutralized in the field so that the waste did not have to be classified as "hazardous" based solely on corrosivity.

Reactivity was determined by mixing a small amount of the unknown waste present with water. Nonreactive solids and liquids will be considered nonhazardous with respect to reactivity. It should be noted that none of the wastes checked at the Horton site were reactive with water.

Horton IBC Removal and Disposal Site
Greenville, South Carolina



HORTON SALES SITE
1870 PIEDMONT HWY
GREENVILLE, SC

FIGURE 3-1:
WASTE HANDLING
DECISION PROCESS

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SITES
GEOSERVICES

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The final hazardous waste classification criteria listed is toxicity. Toxicity presents the most difficulty in evaluating using field screening methodologies. Waste characterization to evaluate toxicity at the Horton site was accomplished by laboratory analysis. As described in Section 5.5 of this Removal Action Report, liquids and solids passing the field screening criteria were combined into onsite frac tanks and sludge boxes, respectively. Once the waste container was full, a composite sample from each batch of liquids and solids was collected and submitted to SHEALY for analysis of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and target analyte list (TAL) metals. This quality control measure provided documentation concerning toxicity and ensured proper waste classifications were established for transportation and disposal purposes.

§5.6

3.4.2.2 Waste Characterization of Labeled IBCs

Many IBCs observed during the October 27, 2006 site visit had labels describing the chemicals present and any potential associated hazards. For waste-containing IBCs with labeled contents, a visual inspection by an environmental technician was performed. The IBC was evaluated to determine whether the container was structurally-sound for transportation to the central processing area. Information concerning the stored waste was also evaluated to ensure that onsite transportation of the IBC did not present a potential health or safety risk.

In the event that the IBC could be transported safely to the central processing area, the all-terrain forklift was utilized for moving the container. Prior to moving the IBC onto the concrete pad, information (on the label) concerning the stored waste was reviewed to determine the proper disposal protocol. Initially, a hazardous vs. nonhazardous determination was made for each container of stored waste. As described in the previous section, field screening was performed to evaluate the following waste characteristics: ignitability, corrosivity and reactivity. This data was used as a field quality control check in the event that the IBC was inaccurately labeled. Nonhazardous wastes were evaluated for compatibility with other nonhazardous wastes that have been combined into one or more onsite holding tanks. Once a determination of compatibility had been made, liquids and/or solids within each IBC were transferred via pump or vacuum truck into the appropriate onsite holding tank.

In the event that the IBC could not be transported to the central processing area, NES personnel performed the waste characterization activities described previously without moving the container. A vacuum or pump truck was used to transfer nonhazardous liquids from the staged IBC down to the onsite holding tank. Once all liquids and solids were removed from the damaged IBCs, the all-terrain forklift safely transported the empty container down to the central processing area for rinsing (as needed) and cutting.

3.4.2.3 IBC Decontamination

Once each waste-containing IBC had been emptied of the liquid and/or solid waste present, the empty container was placed on the concrete platform (if not already present) for final decontamination. Each container was rinsed (as needed) using the onsite pressure washer. The rinse water was allowed to drain into the decontamination pad sump area. The water was transferred into an onsite holding tank. The rinsed plastic containers were then cut into pieces. The resulting material was transported offsite to the Union County Landfill for disposal.

3.5 IBC Waste Transportation & Disposal

As stated previously, nonhazardous solid and liquid wastes from individual IBCs were consolidated into onsite bulk containers (i.e. frac tanks and sludge boxes). Once these containers were full, a composite sample was collected from each batch and submitted to SHEALY for laboratory analysis. Each sample was analyzed for VOCs using EPA Method 8260B, semi-VOCs using EPA Method 8270C and the TAL metals using appropriate EPA analytical methods. In the event that analytical data confirmed the nonhazardous nature of the material, the bulk liquids or solids were transported to Vopak Logistics Services USA (Vopak), located in Mauldin, SC, for disposal. In samples where laboratory analyses revealed the presence of elevated concentrations of VOCs, semi-VOCs and/or metals where a regulatory limit for disposal had been established, the sample was reanalyzed using the toxicity characteristic leaching procedure (TCLP) for the compound or compounds in question. Results from the TCLP analysis directed whether the waste was classified as hazardous or nonhazardous for disposal purposes.

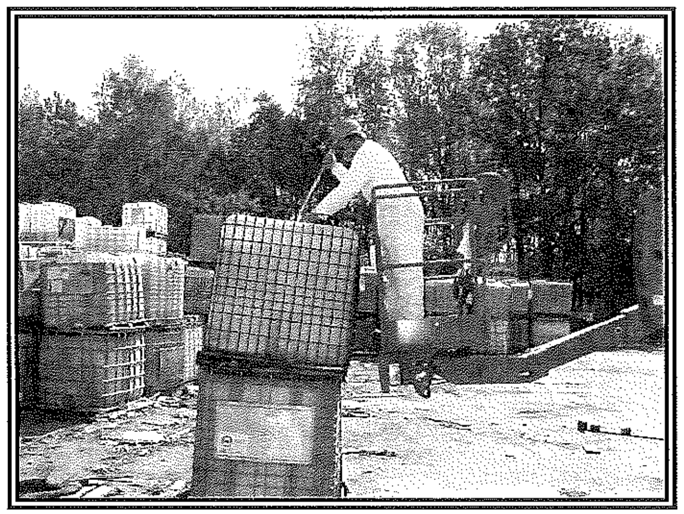
Potentially hazardous waste that was removed from IBCs present at the Horton site was stored in separate drums or appropriate containers pending analysis and full characterization. For solids and liquids that were determined to be classified as hazardous for disposal purposes, the waste was transported for disposal at an appropriate, permitted facility.

3.6 Cage Documentation & Handling

Each metal cage at the Horton site was assigned a unique number for tracking purposes. Labels were still present on many of cages present. Information on each cage label was recorded and transferred into a computer database. A copy of the metal cage database is provided on a computer disk that is attached to the inside back cover of this report. Once the label information had been recorded, the cage was crushed using a tracked excavator and placed into an onsite rolloff box. The crushed cages were transported to Carolina Recycling Group (CRG) located in Wellman, SC for recycling.

3.7 Concrete Sump Cleaning & Abandonment

Once all IBCs had been removed from the Horton site, several in-ground concrete tanks were emptied and permanently abandoned in place. Wastes present within the in-ground concrete tanks were field screened using the same procedure that was used for onsite IBCs. Once the liquids within the in-ground tanks were determined to be classified as nonhazardous, a vacuum truck was used to transfer the liquids to an onsite frac tank. Once the in-ground tanks were empty, clean fill sand was added to fill each tank to near ground surface. Concrete was then used to seal the tanks at ground surface.



Waste Characterization of Liquid-filled IBCs

Section 4.0
Waste Characterization

SECTION 4.0

WASTE CHARACTERIZATION, TRANSPORTATION & DISPOSAL

4.1 IBC Database

As stated previously, each IBC at the Horton site was given a unique identification number in order to generate a database that included the following information:

- condition of each container;
- waste characterization information;
- documentation on any labels present;
- empty IBC disposal documentation;
- waste liquids disposal documentation; and
- waste solids disposal documentation.

Summaries of the data generated during waste characterization, transportation and disposal are provided in the following sections of this report.

4.2 IBC Disposal

During the Horton IBC Removal Project, 9,462 containers were evaluated, cleaned (if necessary) and transported to the Union County Landfill for final disposal. IBC processing activities were implemented during a fourteen month period from December 2006 through January 2008. As stated previously, once each container had been separated from its metal cage (if present), emptied of any waste and cleaned, several cuts were made in the plastic to destroy the container's structural integrity. The plastic was then loaded into an onsite trailer. Once each trailer had been filled to capacity, the load was shipped offsite for disposal as a nonhazardous waste. Copies of the disposal manifests for each trailer of scrap plastic that was sent to the Union County Landfill are provided in Appendix A. A summary of the monthly IBC disposal progress throughout the project is provided in Table 4-1.

TABLE 4-1
IBC DISPOSAL SUMMARY

Monthly Production	Load Numbers	Tons of IBCs Transported to Landfill
January '07	L-0001,L-0002,L-0003,L-0004,L-0005	30.75
February '07	L-0006,L-0007,L-0008	20.41
March '07	L-0009,L-0010,L-0011	16.67
April '07	L-0012,L-0013	15.17
May '07	L-0014,L-0015	14.12
June '07	L-0016,L-0017	17.71
July '07	L-0018	8.96
August '07	L-0019,L-0020	21.51
September '07	L-0021	10.88
October '07	L-0022,L-0023,L-0024	25.12
November '07	L-025,L*-052,L*-053L-026,L-027,L-028	33.39
December '07	L-0029,L-0030	10.27
January '08	L-0031	6.22
Total		231.18

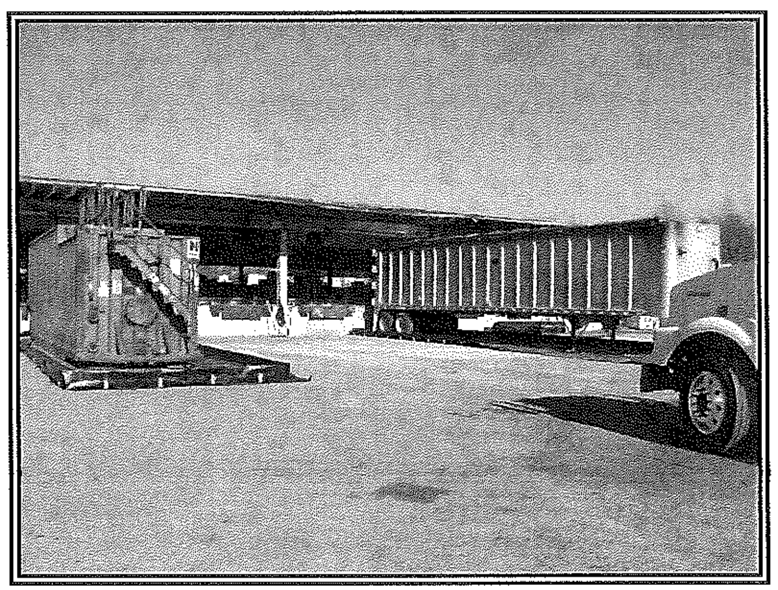
* Tonnage includes wood, soil, etc.

4.3 Field Screening Data

Field screening of waste-containing IBCs was performed, as described in Section 3.4.2, in an effort to make an initial "hazardous" vs. "nonhazardous" determination for waste transportation and disposal purposes. Waste characterization information was compiled using Microsoft Excel software into two databases. The largest database provides waste characterization information on unlabeled IBCs. A smaller database providing waste characterization data was generated on labeled IBCs. A computer disk containing both the labeled and unlabeled IBC databases is provided in a pouch that is attached to the inside back cover of this report.

4.4 Liquid Waste Disposal

After the completion of the field screening process, liquids present in the IBCs were transferred into onsite 27,000 gallon frac tanks staged adjacent to the decontamination area. Rinse water used to clean both liquid and solid-containing IBCs was also transferred into the onsite containers. A composite sample from each frac tank was collected and submitted to SHEALY for analysis. This sampling was performed to ensure that field screening procedures utilized at the Horton site were correct in classifying each waste stream as nonhazardous for handling, transportation and disposal purposes. Each liquid sample was analyzed for VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C and the TAL metals (i.e. aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc). All metals were analyzed using EPA Method 6010B with the exception of mercury (EPA Method 7470A). A summary of the analytical data generated during the liquid waste characterization process is provided in Table 4-2. This table includes only compounds that were detected at concentrations exceeding the corresponding instrument detection limit. Laboratory analytical data sheets are provided on an attached computer disk.



Frac Tank with Secondary Containment Liner

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY

Compound	Tank 01-01	Tank 02-01	Tank 03-01	Tank 02-02	Tank 03-02	Tank 04-01	Tank 02-03	Tank 04-02	Tank 03-03	Tank 01-02	Tank 02-04
VOCs											
Acetone (ug/l)	4100	2100	1700	62	2500	3200	2300	ND	ND	12000	3000
2-Butanone (MEK) (ug/l)	ND	470	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide (ug/l)	5900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	180	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	590	4100	4000	67	2200	1600	3700	2600	2100	1000	2600
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene (ug/l)	3900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	ND	160	ND	19	ND	ND	ND	ND	ND	ND	ND
Semi-VOCs											
Bis(2-Ethylhexyl)phthalate (ug/l)	ND	ND	ND	ND	7200	ND	ND	ND	3800	ND	ND
Caprolactam (ug/l)	11000	17000	27000	22000	2400	140000	21000	35000	11000	75000	17000
Dimethyl phthalate (ug/l)	32000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	ND	ND	3300	ND	1300	ND	ND	2000	ND	ND	ND
Phenol (ug/l)	3000	ND	ND	1100	ND	ND	4000	ND	9400	ND	1100
TAL Metals											
Aluminum (mg/l)	18	19	19	10	12	13	10	31	19	9.8	100
Antimony (mg/l)	3.2	3	4.4	9.9	6.2	8.5	5	6.9	6.8	23	9.5
Arsenic (mg/l)	0.024	0.022	0.021	0.021	0.024	0.029	0.017	0.054	0.017	0.16	0.049
Barium (mg/l)	0.3	0.8	1.1	0.13	0.39	1.9	0.17	0.93	0.22	0.064	0.78
Cadmium (mg/l)	ND	0.022	0.0084	0.0024	ND	ND	0.0024	0.0028	ND	ND	ND
Calcium (mg/l)	86	87	79	56	48	53	32	70	83	47	130
Chromium (mg/l)	0.022	0.1	0.083	0.12	0.16	0.14	0.33	1.1	0.37	0.38	0.71
Cobalt (m/l)	ND	0.04	ND	0.028	0.10	ND	0.03	ND	0.029	0.025	0.12
Copper (mg/l)	1.1	0.7	0.42	1.1	0.32	1	0.93	0.29	0.11	0.85	2.6
Iron (mg/l)	6.4	15	6.2	5.6	6.3	5.2	3.8	15	7.5	3.3	21
Lead (mg/l)	ND	0.032	ND	ND	ND	0.021	ND	0.053	0.072	0.013	0.043
Magnesium (mg/l)	6.7	27	10	12	7.7	ND	ND	15	5.3	5.9	46
Manganese (mg/l)	0.38	1	0.23	1.6	0.22	0.15	1.2	0.36	0.27	1.7	0.42
Mercury (mg/l)	0.00023	ND	ND	0.001	0.00014	0.0014	0.00055	ND	ND	ND	ND
Nickel (mg/l)	0.1	0.57	0.84	3.3	4.0	3.1	0.14	3.5	0.64	0.27	1.7
Selenium (mg/l)	0.01	ND	ND	0.014	ND	ND	ND	0.015	ND	ND	0.029
Silver (mg/l)	ND	0.0072	ND	ND	ND	ND	ND	ND	0.012	ND	ND
Sodium (mg/l)	210	730	1300	430	820	1200	470	480	390	470	320
Vanadium (mg/l)	ND	0.05	ND	0.055	ND	0.2	ND	ND	ND	ND	0.067
Zinc (mg/l)	6.1	6.9	3	13	10	5.7	6.8	17	5.6	10	14
Sample Date	2/9/07	2/16/07	2/26/07	2/28/07	3/13/07	3/6/07	3/16/07	3/20/07	3/23/07	3/28/07	3/30/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 04-03	Tank 03-04	Tank 01-03	Tank 02-05	Tank 04-04	Tank 03-05	Tank 01-04	Tank 02-06	Tank 04-05	Tank 03-06	Tank 01-05
VOCs											
Acetone (ug/l)	3900	3600	2500	13000	2000	ND	3100	18000	9000	2900	4000
2-Butanone (MEK) (ug/l)	ND	ND	ND	610	ND	ND	ND	780	ND	ND	ND
Carbon Disulfide (ug/l)	ND	ND	ND	ND	ND	ND	440	ND	620	2400	ND
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	ND	420	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	21000	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	5600	3700	1200	1700	1500	1400	1100	2000	1600	960	1700
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	ND	ND	760	380	ND	2500	2000	900	360	ND	ND
Semi-VOCs											
Bis(2-Ethylhexyl)phthalate (ug/l)	ND	ND	ND	ND	8700	ND	1200	ND	67000	ND	ND
Caprolactam (ug/l)	ND	12000	ND	ND	ND	610000	ND	ND	ND	52000	26000
Dimethyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	18000	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	33000	7600	ND
Phenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	2800	73000	ND	ND
TAL Metals											
Aluminum (mg/l)	34	4.9	22	36	3.6	420	4.8	5.6	1.2	3.9	8.1
Antimony (mg/l)	16	2.2	9.3	14	8.4	55	7.2	3.2	1.2	5.8	5.2
Arsenic (mg/l)	0.029	ND	0.035	0.043	0.019	ND	0.03	0.021	ND	0.038	ND
Barium (mg/l)	0.74	0.071	0.084	0.31	0.098	1.8	0.72	0.99	0.059	0.19	0.32
Cadmium (mg/l)	0.0036	ND	0.007	ND	ND	ND	ND	ND	ND	0.0082	ND
Calcium (mg/l)	78	48	63	100	73	310	150	100	65	65	46
Chromium (mg/l)	0.21	0.47	0.96	1.7	0.23	1.1	0.065	0.14	0.1	0.036	0.14
Cobalt (m/l)	ND	ND	ND	0.027	ND	ND	ND	0.031	ND	ND	0.13
Copper (mg/l)	3.2	0.66	0.11	0.16	0.11	1.3	0.07	0.13	0.062	0.039	1.3
Iron (mg/l)	13	3.5	7	6.8	7.8	100	7	5.2	3.8	5.6	3.4
Lead (mg/l)	0.044	ND	0.044	ND	ND	ND	0.039	0.031	0.021	0.041	ND
Magnesium (mg/l)	8.6	6.5	15	15	10	ND	18	16	12	35	ND
Manganese (mg/l)	6	0.28	0.23	0.2	0.32	0.96	0.19	0.22	0.21	0.15	0.13
Mercury (mg/l)	0.0029	0.00023	ND	ND	0.0029	ND	ND	ND	ND	0.0062	ND
Nickel (mg/l)	2.8	2.2	13	0.7	3.9	4.0	0.7	8.7	0.16	0.14	3.2
Selenium (mg/l)	ND	ND	ND	ND	ND	ND	ND	0.013	0.01	ND	ND
Silver (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	290	550	940	570	400	330	470	540	520	730	370
Vanadium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	ND
Zinc (mg/l)	8.6	22	12	16	5.4	58	24	31	13	13	5.2
Sample Date	4/4/07	4/6/07	4/11/07	4/13/07	4/17/07	4/20/07	4/24/07	4/27/07	5/3/07	5/8/07	5/15/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 02-07	Tank 04-06	Tank 01-06	Tank 03-07	Tank 02-08	Tank 04-07	Tank 03-08	Tank 01-07	Tank 02-09	Tank 04–08
VOCs										
Acetone (ug/l)	2100	980	16000	ND	3000	8900	41000	42000	3200	14000
2-Butanone (MEK) (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide (ug/l)	ND	50	ND	310	ND	440	ND	620	2400	ND
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	420	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	1200	460	1400	840	1600	950	1300	1200	2300	670
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	330	ND	1600	ND	ND	ND	330	320
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	ND	ND	760	380	670	2000	900	1000	ND	600
Semi-VOCs										
Bis(2-Ethylhexyl)phthalate (ug/l)	ND	ND	2100	10000	12000	2300	16000	5000	ND	ND
Caprolactam (ug/l)	9800	47000	11000	27000	5500	ND	ND	28000	ND	23000
Dimethyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	1500	ND	ND	ND	ND	18000	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	440	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	4000	ND	ND	ND	770	ND	ND	1600	ND	4700
Phenol (ug/l)	590	ND	ND	ND	2000	ND	ND	1000	ND	1700
TAL Metals										
Aluminum (mg/l)	9.6	11	5.2	180	7.6	6.1	56	6	12	8.4
Antimony (mg/l)	0.28	7.3	1.5	11	1.5	5.6	66	3.8	2.3	2.5
Arsenic (mg/l)	ND	0.016	0.013	0.025	0.015	0.021	ND	ND	ND	ND
Barium (mg/l)	0.071	0.16	0.12	2.1	0.19	0.12	1.2	0.33	0.096	0.27
Cadmium (mg/l)	ND	ND	ND	0.0045	0.0058	ND	0.014	ND	ND	ND
Calcium (mg/l)	25	35	44	84	66	57	170	23	40	39
Chromium (mg/l)	ND	0.12	0.17	2.6	0.029	1.5	40	0.26	0.073	0.04
Cobalt (m/l)	ND	ND	ND	ND	0.034	0.078	0.23	0.32	ND	ND
Copper (mg/l)	ND	0.041	2.4	0.33	0.061	0.18	0.38	0.046	0.69	0.17
Iron (mg/l)	2.2	5.2	8.3	18	11	8.9	22	7.8	6.1	5.9
Lead (mg/l)	ND	ND	0.02	0.067	ND	0.039	0.3	ND	ND	ND
Magnesium (mg/l)	ND	17	ND	44	5.2	ND	27	74	ND	ND
Manganese (mg/l)	0.12	0.14	0.16	0.26	0.24	0.21	0.57	0.23	0.16	0.14
Mercury (mg/l)	ND	ND	ND	0.0022	ND	ND	0.006	ND	ND	ND
Nickel (mg/l)	0.12	0.064	0.12	0.28	1.6	0.092	0.4	0.46	0.12	ND
Selenium (mg/l)	ND	ND	0.02	0.011	ND	ND	ND	ND	ND	ND
Silver (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	160	320	400	530	570	280	670	520	830	480
Vanadium (mg/l)	ND	ND	ND	0.37	ND	ND	1.1	ND	0.13	ND
Zinc (mg/l)	0.74	7	6.2	28	7	6.6	29	2.3	5.7	3.1
Sample Date	5/15/07	5/17/07	5/22/07	5/22/07	5/25/07	6/1/07	6/5/07	6/7/07	6/8/07	6/13/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 01-08	Tank 02-10	Tank 04-09	Tank 01-09	Tank 02-11	Tank 04-10	Tank 01-10	Tank 02-12	Tank 03-09	Tank 04–11
VOCs										
Acetone (ug/l)	2800	6200	580	1800	1000	2200	2000	2300	ND	430
2-Butanone (MEK) (ug/l)	ND	ND	ND	360	ND	20000	2000	ND	ND	ND
Carbon Disulfide (ug/l)	320	910	ND	130	230	ND	ND	ND	ND	540
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	3600	2000	360	900	2100	1200	2000	1200	980	4000
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	ND	ND	380	ND	ND	ND	330	ND
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	ND	ND	ND	ND	120	660	ND	ND	ND	ND
Semi-VOCs										
Bis(2-Ethylhexyl)phthalate (ug/l)	1400	1800	ND	8200	ND	ND	ND	ND	ND	650
Caprolactam (ug/l)	91000	54000	ND	17000	7800	ND	ND	ND	ND	ND
Dimethyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	970
2-Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	3100	ND	ND	ND	ND	6900	ND	ND	ND	2200
Phenol (ug/l)	1200	1300	ND	ND	ND	580	ND	ND	ND	ND
TAL Metals										
Aluminum (mg/l)	9.2	7.7	7.5	100	36	6.8	13	4.9	1.9	26
Antimony (mg/l)	5.2	6.3	3.3	2.4	0.26	0.46	0.88	1.8	0.44	12
Arsenic (mg/l)	ND	ND	ND	ND	ND	ND	ND	0.017	0.01	ND
Barium (mg/l)	2.1	0.41	1.1	1.4	0.031	ND	0.71	0.2	0.18	2.4
Cadmium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium (mg/l)	57	84	22	120	35	ND	ND	36	31	60
Chromium (mg/l)	1.1	0.33	0.071	ND	0.019	ND	0.063	0.018	0.6	0.049
Cobalt (m/l)	0.059	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper (mg/l)	0.96	1.4	0.65	ND	0.036	0.63	1.9	0.12	0.21	0.095
Iron (mg/l)	7.2	12	16	20	3.8	4	7.9	9.7	11	6
Lead (mg/l)	ND	ND	0.054	ND	ND	ND	ND	0.022	0.2	0.027
Magnesium (mg/l)	ND	12	ND	ND	6.9	ND	ND	5.2	6.4	10
Manganese (mg/l)	0.17	0.27	0.45	ND	0.12	0.17	6	0.21	0.2	0.14
Mercury (mg/l)	0.0016	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel (mg/l)	1.8	0.12	ND	ND	2.7	ND	ND	2.5	0.16	ND
Selenium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	650	900	74	420	290	340	380	360	500	550
Vanadium (mg/l)	0.62	ND	ND	ND	0.087	ND	ND	ND	ND	ND
Zinc (mg/l)	5.9	12	4.8	35	2.1	2.6	5.3	2.6	5.1	3.5
Sample Date	6/19/07	6/21/07	6/25/07	6/29/07	7/10/07	7/13/07	7/18/07	7/26/07	7/26/07	7/31/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 01-11	Tank 03-10	Tank 02-13	Tank 04-12	Tank 01-12	Tank 03-11	Tank 02-14	Tank 01-13	Tank 04-13	Tank 03-12	Tank 02–15
VOCs											
Acetone (ug/l)	16000	2800	ND	20000	37000	3300	8200	2000	1100	1100	9500
2-Butanone (MEK) (ug/l)	500	ND	ND	ND	ND	260	ND	240	ND	ND	ND
Carbon Disulfide (ug/l)	ND	ND	300	ND	ND	ND	ND	41	420	420	ND
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	65	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	4800	1500	1200	ND	3300	1200	2400	1100	880	880	2200
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	660	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	910	ND	320	ND	ND	ND	ND	ND	ND	ND	ND
Semi-VOCs											
Bis(2-Ethylhexyl)phthalate (ug/l)	6100	ND	ND	6000	2200	15000	22000	40000	7000	12000	3500000
Caprolactam (ug/l)	ND	ND	46000	52000	57000	54000	170000	5200	240000	3200	ND
Dimethyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	720	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	ND	1400	ND	ND	ND	ND	ND	ND	4300	1600	2200
Phenol (ug/l)	ND	ND	ND	ND	510	ND	ND	ND	1400	680	11000
TAL Metals											
Aluminum (mg/l)	17	12	10	18	12	46	24	4	79	6	2
Antimony (mg/l)	7.5	2.5	6.1	5.8	2.7	9.7	7.3	1.8	7.2	1.6	0.18
Arsenic (mg/l)	ND	ND	ND	ND	0.027	0.035	ND	0.11	2.0	ND	ND
Barium (mg/l)	1.2	0.31	0.34	0.95	0.66	2.7	0.64	0.45	1.5	0.78	13
Cadmium (mg/l)	ND	ND	ND	ND	0.0021	0.018	ND	ND	ND	ND	ND
Calcium (mg/l)	ND	57	82	71	74	140	73	61	140	ND	39
Chromium (mg/l)	ND	0.058	0.84	0.13	0.55	1.4	0.46	0.076	0.20	0.14	ND
Cobalt (m/l)	ND	ND	ND	ND	0.036	0.24	ND	ND	ND	ND	ND
Copper (mg/l)	0.67	0.092	0.71	0.49	0.19	0.45	0.41	1.3	1.0	0.22	0.13
Iron (mg/l)	11	6.2	14	16	12	23	19	11	46	5.9	3.6
Lead (mg/l)	ND	ND	ND	0.17	0.045	0.07	0.14	0.25	3.4	ND	0.42
Magnesium (mg/l)	ND	ND	ND	32	20	28	32	42	57	ND	ND
Manganese (mg/l)	1	0.17	0.3	0.3	0.47	0.36	0.28	0.35	0.65	0.14	0.16
Mercury (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	0.0035	ND	0.00064
Nickel (mg/l)	ND	4.5	ND	ND	0.7	0.33	ND	0.78	ND	2.5	6.1
Selenium (mg/l)	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND
Silver (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	730	580	660	620	690	860	450	600	490	600	700
Vanadium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc (mg/l)	3	2.3	3.2	4.4	4	6.2	14	3.3	15	2.3	7.5
Sample Date	8/3/07	8/7/07	8/10/07	8/15/07	8/16/07	8/20/07	8/22/07	8/31/07	9/04/07	9/6/07	9/11/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 04-14	Tank 01-14	Tank 03-13	Tank 02-16	Tank 04-15	Tank 01-15	Tank 03-14	Tank 04-16	Tank 02-17	Tank 01–16
VOCs										
Acetone (ug/l)	1300	800	3300	4700	1700	1500	2100	1200	3400	26000
2-Butanone (MEK) (ug/l)	ND	300	2000	450	350	240	870	420	ND	1500
Carbon Disulfide (ug/l)	ND	ND	ND	ND	74	70	ND	70	120	ND
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	ND	ND	62	ND	69	62	ND	66	110	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	240	ND	ND	ND	ND	ND
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	110	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	94	ND	78	140	ND
Methylene chloride (ug/l)	4800	4600	2800	2700	2400	2000	2800	2300	2900	3200
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	53	ND	ND	ND	ND
Xylenes (ug/l)	ND	110	ND	ND	990	ND	ND	170	ND	ND
Semi-VOCs										
Bis(2-Ethylhexyl)phthalate (ug/l)	16000	77000	170000	1200000	ND	73000	ND	48000	1900	ND
Caprolactam (ug/l)	16000	73000	ND	ND	40000	35000	ND	ND	32000	6600
Dimethyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	690	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	1500	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/l)	5200	ND	ND	ND	ND	ND	ND	ND	1400	550
TAL Metals										
Aluminum (mg/l)	8.2	6.8	25	46	21	4.3	2.8	23	13	3.8
Antimony (mg/l)	0.53	1.2	1.6	1.7	0.86	3.8	2.3	3.7	5.2	24
Arsenic (mg/l)	0.022	ND	ND	ND	ND	ND	0.016	0.035	ND	0.029
Barium (mg/l)	0.54	0.57	5.7	6.1	0.57	1.1	0.25	0.81	0.12	0.46
Cadmium (mg/l)	0.0023	ND	ND	ND	ND	ND	ND	0.0025	0.0024	ND
Calcium (mg/l)	40	ND	79	180	ND	60	38	49	70	34
Chromium (mg/l)	0.14	0.41	1.4	12	1.4	8.6	0.063	2.2	0.23	0.016
Cobalt (m/l)	0.21	ND	ND	ND	ND	ND	0.08	0.29	0.45	ND
Copper (mg/l)	0.38	0.23	0.45	0.79	0.19	0.083	0.1	0.27	0.9	0.89
Iron (mg/l)	11	14	23	50	7.9	11	6.6	12	7.6	4.6
Lead (mg/l)	0.18	0.14	ND	1.1	0.1	0.15	ND	0.022	ND	ND
Magnesium (mg/l)	15	ND	ND	89	ND	ND	20	20	15	12
Manganese (mg/l)	0.2	0.24	0.81	3.1	0.3	0.22	0.12	0.22	0.27	0.15
Mercury (mg/l)	0.0059	ND	ND	0.0048	ND	ND	ND	ND	ND	ND
Nickel (mg/l)	3.2	ND	0.64	1.7	ND	ND	0.07	0.16	0.07	0.074
Selenium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	570	780	340	660	570	400	460	520	390	620
Vanadium (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Zinc (mg/l)	3.9	9	9.2	24	15	5.7	1.4	12	12	21
Sample Date	9/14/07	9/19/07	9/25/07	9/28/07	10/3/07	10/8/07	10/12/07	10/17/07	10/19/07	10/26/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 03-15	Tank 04-17	Tank 02-18	Tank 01-17	Tank 03-16	Tank 04-18	Tank 01-18	Tank 02-19	Tank 03-17	Tank 04 – 19
VOCs										
Acetone (ug/l)	7000	2100	ND	6700	7300	5000	18000	2800	2000	ND
2-Butanone (MEK) (ug/l)	220	ND	ND	ND	ND	ND	1400	550	ND	ND
Carbon Disulfide (ug/l)	1300	200	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride (ug/l)	ND	100	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/l)	120	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone (ug/l)	350	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/l)	1700	920	ND	760	1700	1500	3300	2200	2500	ND
Tetrachloroethene (ug/l)	ND	ND	400	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	54	ND
Trichloroethene (ug/l)	ND	ND	1100	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/l)	ND	190	ND	ND	ND	ND	ND	ND	52	ND
Semi-VOCs										
Bis(2-Ethylhexyl)phthalate (ug/l)	3500	65000	9200	4900	62000	26000	780	270	ND	1100
Caprolactam (ug/l)	22000	150000	ND	ND	22000	50000	9400	6000	ND	2700
Dimethyl phthalate (ug/l)	9600	ND	11000	3300	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/l)	5800	ND	ND	2900	14000	ND	640	230	1200	ND
Phenol (ug/l)	ND	8900	ND	2300	3700	ND	ND	ND	3500	1900
TAL Metals										
Aluminum (mg/l)	8.3	17	7	26	56	9.1	ND	10	2.9	16
Antimony (mg/l)	2.7	5.9	2.1	4.9	7.9	2.6	0.68	1.5	0.28	2.5
Arsenic (mg/l)	ND	0.033	0.031	0.025	0.035	ND	ND	ND	0.016	ND
Barium (mg/l)	0.34	14	0.31	2.1	2.2	0.79	ND	ND	0.16	0.29
Cadmium (mg/l)	ND	ND	ND	ND	0.0047	ND	ND	ND	ND	ND
Calcium (mg/l)	ND	450	42	58	160	120	ND	ND	72	26
Chromium (mg/l)	015	0.11	0.13	ND	0.48	0.32	ND	0.26	0.025	0.032
Cobalt (m/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper (mg/l)	1.2	0.42	1.5	4.3	1.2	0.32	ND	0.28	0.086	0.3
Iron (mg/l)	9.2	13	8.3	32	32	6.4	3.6	17	6.6	16
Lead (mg/l)	ND	0.092	ND	0.089	0.94	ND	ND	ND	ND	ND
Magnesium (mg/l)	ND	21	8	60	14	ND	ND	ND	6	7.1
Manganese (mg/l)	0.21	0.55	0.22	0.52	0.48	ND	ND	ND	0.13	0.18
Mercury (mg/l)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0009
Nickel (mg/l)	ND	0.27	0.085	ND	0.2	ND	ND	ND	0.36	0.14
Selenium (mg/l)	ND	0.017	ND	ND	ND	ND	ND	ND	ND	0.011
Silver (mg/l)	ND	0.005	ND	ND	ND	ND	ND	ND	ND	ND
Sodium (mg/l)	460	180	470	700	980	660	470	420	530	39
Vanadium (mg/l)	ND	ND	ND	0.054	0.06	ND	ND	ND	0.062	ND
Zinc (mg/l)	6.9	8.9	6.9	12	9.4	8.4	9	7	3.4	3.8
Sample Date	11/1/07	11/2/07	11/9/07	11/14/07	11/16/07	11/21/07	11/28/07	11/29/07	12/4/07	12/6/07

TABLE 4-2: LIQUID WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Tank 01-19	Tank 02-20	Tank 03-18	Tank 04-20	Tank 01-20	Tank 03-19			
VOCs									
Acetone (ug/l)	4600	49000	1800	1900	1200	260			
2-Butanone (MEK) (ug/l)	380	ND	ND	1800	ND	ND			
Carbon Disulfide (ug/l)	ND	ND	ND	ND	ND	ND			
Carbon Tetrachloride (ug/l)	ND	ND	ND	ND	ND	ND			
Chloroform (ug/l)	ND	ND	200	ND	ND	55			
Ethylbenzene (ug/l)	ND	ND	ND	ND	ND	ND			
2-Hexanone (ug/l)	ND	ND	ND	ND	ND	ND			
4-Methyl-2-pentanone (ug/l)	120	ND	ND	ND	ND	ND			
Methyl acetate (ug/l)	ND	ND	ND	ND	ND	ND			
Methylene chloride (ug/l)	890	1800	1900	1800	5800	290			
Tetrachloroethene (ug/l)	ND	ND	ND	ND	ND	ND			
Toluene (ug/l)	ND	ND	ND	ND	ND	ND			
Trichloroethene (ug/l)	ND	ND	ND	ND	ND	ND			
Xylenes (ug/l)	ND	ND	ND	ND	ND	ND			
Semi-VOCs									
Bis(2-Ethylhexyl)phthalate (ug/l)	ND	260	1300	ND	620	1600			
Caprolactam (ug/l)	11000	12000	42000	42000	14000	1500			
Isophorone (ug/l)	ND	ND	ND	ND	ND	68			
2-Methylphenol (ug/l)	ND	650	ND	ND	ND	ND			
3 & 4 Methylphenol (ug/l)	ND	ND	ND	ND	ND	370			
Phenol (ug/l)	1900	290	ND	8400	1200	ND			
TAL Metals									
Aluminum (mg/l)	7.1	ND	4.5	ND	9.5	0.79			
Antimony (mg/l)	1.1	0.57	1.6	0.64	0.54	0.38			
Arsenic (mg/l)	ND	ND	0.011	ND	0.01	0.012			
Barium (mg/l)	ND	ND	0.55	1.5	0.21	0.10			
Cadmium (mg/l)	ND	ND	ND	ND	ND	ND			
Calcium (mg/l)	ND	89	160	ND	42	57			
Chromium (mg/l)	ND	0.53	0.59	0.28	0.069	0.041			
Cobalt (m/l)	ND	ND	ND	ND	ND	ND			
Copper (mg/l)	ND	0.092	0.17	ND	0.066	0.016			
Iron (mg/l)	6.4	8.7	5.8	6.9	6.2	2.6			
Lead (mg/l)	ND	ND	0.017	ND	0.025	ND			
Magnesium (mg/l)	ND	ND	8.2	ND	10	ND			
Manganese (mg/l)	0.28	0.23	0.14	ND	0.18	0.081			
Mercury (mg/l)	ND	ND	0.00078	ND	ND	ND			
Nickel (mg/l)	ND	ND	0.096	ND	0.043	0.055			
Selenium (mg/l)	ND	ND	ND	ND	0.019	ND			
Silver (mg/l)	ND	ND	ND	ND	ND	ND			
Sodium (mg/l)	600	590	930	460	420	170			
Vanadium (mg/l)	ND	ND	ND	ND	ND	ND			
Zinc (mg/l)	5.2	6	20	3.2	5.3	2.3			
Sample Date	12/10/07	12/18/07	12/21/07	1/4/08	1/15/08	1/23/08			

ND – Not Detected

Upon receipt of the laboratory data, the information was submitted to personnel at Vopak for review. During the Horton Removal Action project, approximately 1,282,179 gallons of liquid were shipped to Vopak as nonhazardous waste for disposal. A summary of liquid waste disposal activities during the Horton Site project is provided in Table 4-3. Copies of the liquid waste disposal manifests are provided in Appendix B.

TABLE 4-3
NONHAZARDOUS LIQUID DISPOSAL SUMMARY

Frac Tank #	Bladder Range	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 2 Load 1	B-1458 – B-1720	022201,022202, 022203,022204	2/22/07	18,365	Nonhazardous
Tank 3 Load 1	B-1721 – B-1864	030501,030502, 030503,030504	3/5/07	17,626	Nonhazardous
Tank 2 Load 2	B-1865 – B-1940	030601,030602, 030801	3/6/07, 3/8/07	13,475	Nonhazardous
Tank 4 Load 1	B-1941 – B-1984	031401,031402, 031403,031501	3/14/07, 3/15/07	17,985	Nonhazardous
Tank 3 Load 2	B-1985 – B-2197	032101,032102, 032103,032104	3/21/07	19,737	Nonhazardous
Tank 2 Load 3	B-2198 – B-2260	032301,032302, 032303,032304	3/23/07	17,426	Nonhazardous
Tank 4 Load 2	B-2261 – B-2356	032901,032902, 032903,032904	3/29/07, 3/30/07	18,436	Nonhazardous
Tank 3 Load 3	B-2357 – B-2491	033001,033003, 033004, 033005	3/30/07	18,857	Nonhazardous
Tank 1 Load 2	B-2492 – B-2574	040402,040403, 040501,040502	4/4/07, 4/5/07	17,994	Nonhazardous
Tank 2 Load 4	B-2575 – B-2644	040901,040902, 040903	4/9/07	14,820	Nonhazardous
Tank 4 Load 3	B-2645 – B-2734	041001,041101, 041102,041103	4/10/07, 4/11/07	19,389	Nonhazardous
Tank 3 Load 4	B-2735 – B-2815	041301,041602, 041603,041604	4/13/07, 4/16/07	16,808	Nonhazardous
Tank 1 Load 3	B-2816 – B-2929	041702,041703, 041801,041802	4/17/07, 4/18/07	18,143	Nonhazardous
Tank 2 Load 5	B-2930 – B-3000	042002,042301, 042302,042303	4/20/04, 4/23/07	17,307	Nonhazardous
Tank 4 Load 4	B-3001 – B-3104	042304,042402, 042403,042304	4/23/07 4/24/07	17,634	Nonhazardous
Tank 3 Load 5	B-3105 – B-3219	042701,042702, 042703,042704	04/2707	19,341	Nonhazardous

TABLE 4-3
NONHAZARDOUS LIQUID DISPOSAL SUMMARY (Continued)

Frac Tank #	Bladder Range	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 1 Load 4	B-3220 – B-3309	050101,050202, 050203	5/01/07 5/02/07	15,154	Nonhazardous
Tank 2 Load 6	B-3317 – B-3403	050301,050401, 050402,050403	5/03/07 5/04/07	17,439	Nonhazardous
Tank 4 Load 5	B-3404 – B-3517	050901,050902, 050903,050904	5/09/07	18,336	Nonhazardous
Tank 3 Load 6	B-3521 – B-3643	051501,051601, 051602,051603	5/15/07 5/16/07	19,227	Nonhazardous
Tank 1 Load 5	B-3650 – B-3725	051702,051703, 051801,051802	5/17/07 5/18/07	15,873	Nonhazardous
Tank 2 Load 7	B-3727 – B-3847	052201,052202, 052203,052204	5/22/07	17,603	Nonhazardous
Tank 4 Load 6	B-3852 – B-3953	052901,052902, 052903,052904	5/29/07	17,830	Nonhazardous
Tank 3 Load 7	B-3955 – B-4041	053001,053002, 053003,053004	5/30/07	16,131	Nonhazardous
Tank 1 Load 6	B-4042 – B-4105	060401,060402, 060403,060501	6/04/07 6/05/07	16,761	Nonhazardous
Tank 2 Load 8	B-4108 – B-4226	060502,060503, 060601,060602	6/05/07 6/06/07	17,714	Nonhazardous
Tank 4 Load 7	B-4235 – B-4333	060701,060702, 060703,060704	6/07/07	17,763	Nonhazardous
Tank 1 Load 7	B-4426 – B-4502	061401,061402, 061501	6/14/07 6/15/07	16,691	Nonhazardous
Tank 2 Load 9	B-4524 – B-4618	061801,061901, 061902	6/18/07 6/19/07	16,118	Nonhazardous
Tank 4 Load 8	B-4619 – B-4737	062002,062003, 062101	6/20/07 6/21/07	17,189	Nonhazardous
Tank 1 Load 8	B-4768 – B-4853	062501,062502, 062601	6/25/07 6/26/07	16,521	Nonhazardous
Tank 2 Load 10	B-4856 – B-4935	062801,062901, 062902	6/28/07 6/29/07	16,659	Nonhazardous

TABLE 4-3
NONHAZARDOUS LIQUID DISPOSAL SUMMARY (Continued)

Frac Tank #	Bladder Range	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 4 Load 9	B-4936 – B-5011	070201,070202, 070301,070302	7/02/07 7/03/02	15,021	Nonhazardous
Tank 1 Load 9	B-5013 – B-5096	071001,071002, 071003,071101	7/10/07 7/11/07	16,741	Nonhazardous
Tank 2 Load 11	B-5097 – B-5189	071701,071702, 071703	7/17/07	16,828	Nonhazardous
Tank 4 Load 10	B-5191 – B-5327	072001,072002, 072301,072302	7/20/07 7/23/07	17,110	Nonhazardous
Tank 1 Load 10	B-5329 – B-5419	072601,072602, 072603	7/26/07	16,927	Nonhazardous
Tank 3 Load 9	B-5421 – B-5514	080101,080102, 080104,080201	8/01/07 8/02/07	19,256	Nonhazardous
Tank 2 Load 12	B-5515 – B-5636	080202,080203, 080204,080301	8/02/07 8/03/07	20,161	Nonhazardous
Tank 4 Load 11	B-5637 – B-5705	080601,080602, 080701,080702	8/06/07 8/07/07	18,734	Nonhazardous
Tank 1 Load 11	B-5707 – B-5809	081001,081002, 081003,081004	8/10/07	17,182	Nonhazardous
Tank 3 Load 10	B-5812 – B-5903	081401,081402, 081501,081502	8/14/07 8/15/07	17,289	Nonhazardous
Tank 2 Load 13	B-5904 – B-6007	082001,082002 082003	8/20/07	16,972	Nonhazardous
Tank 4 Load 12	B-6008 – B-6101	082201,082202 082203,082301	8/22/07 8/23/07	17,808	Nonhazardous
Tank 1 Load 12	B-6102 – B-6183	082302,082303 082401,082402	8/23/07 8/24/07	17,460	Nonhazardous
Tank 3 Load 11	B-6184 – B-6298	082801,082802 082803,082804	8/28/07	18,192	Nonhazardous
Tank 2 Load 14	B-6299 – B-6373	083101,083102 083103,090401	8/31/07 9/04/07	15,975	Nonhazardous
Tank 4 Load 13	B-6374 – B-6525	091001,091101 091102	9/10/07 9/11/07	14,886	Nonhazardous
Tank 1 Load 13	B-6526 – B-6608	091201,091202 091301,091302	9/12/07 9/13/07	19,558	Nonhazardous

TABLE 4-3
NONHAZARDOUS LIQUID DISPOSAL SUMMARY (Continued)

Frac Tank #	Bladder Range	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 3 Load 12	B-6613 – B-6772	091303,091304 091401,091402	9/13/07 9/14/07 9/17/07	19,408	Nonhazardous
Tank 2 Load 15	B-6774 – B-6850	091902,091903 091904,092001	9/19/07 9/20/07	17,105	Nonhazardous
Tank 4 Load 14	B-6852 – B-6982	092501,092502 092503,092601	9/25/07 9/26/07	17,452	Nonhazardous
Tank 1 Load 14	B-6987 – B-7075	092602,092801 100101,100102	9/28/07 10/01/07	16,603	Nonhazardous
Tank 3 Load 13	B-7076 – B-7192	100301,100302 100303,100304	10/03/07	17,185	Nonhazardous
Tank 4 Load 15	B-7285 – B-7380	101001,101002 101101,101102	10/10/07 10/11/07	17,518	Nonhazardous
Tank 3 Load 14	B-7472 – B-7585	102501,102502 102503,102504	10/25/07	19,070	Nonhazardous
Tank 4 Load 16	B-7587 – B-7682	103101,103102 103103,103104	10/31/07	18,488	Nonhazardous
Tank 2 Load 17	B-7684 – B-7756	110201,110202, 110501,110502	11/02/07 11/05/07	16,169	Nonhazardous
Tank 1 Load 16	B-7757 – B-7873	110801,110802 110804,110901	11/08/07 11/09/07	15,787	Nonhazardous
Tank 3 Load 15	B-7898 – B-8024	111301,111302 111303,111304	11/13/07	18,476	Nonhazardous
Tank 4 Load 17	B-8025 – B-8096	111401,111402 111403	11/14/07	14,533	Nonhazardous
Tank 1 Load 17	B-8193 – B-8334	112001,112002 112101,112102	11/20/07 11/21/07	18,249	Nonhazardous
Tank 3 Load 16	B-8335 – B-8455	113001,113002, 113003,113004	11/30/07	17,709	Nonhazardous
Tank 4 Load 18	B-8456 – B-8605	120301,120401 120402,120403	12/03/07 12/04/07	16,760	Nonhazardous
Tank 1 Load 18	B-8607 – B-8695	120601,120602 120603,120604	12/06/07	17,107	Nonhazardous
Tank 2 Load 19	B-8696 – B-8805	121101,121102 121103,121104	12/11/07	19,605	Nonhazardous
Tank 3 Load 17	B-8806 – B-8935	121701,121801 121802,121803	12/17/07 12/18/07	16,801	Nonhazardous
Tank 4 Load 19	B-8936 – B-9068	121804,121901 121902,121903	12/18/07 12/19/07	19,201	Nonhazardous
Tank 1 Load 19	B-9069 – B-9171	122701,010201 010202,010203	12/27/07 1/02/08	16,148	Nonhazardous

TABLE 4-3
NONHAZARDOUS LIQUID DISPOSAL SUMMARY (Continued)

Frac Tank #	Bladder Range	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 2 Load 20	B-9172 – B-9304 √	010301,010302 010401,010402, 010901	1/03/08 1/02/08	18,546	Nonhazardous
Tank 3 Load 18	B-9305 – B-9379 √	010801,010803 010805,011501	1/08/08	18,903	Nonhazardous
Tank 4 Load 20	B-9382 – B-9457	011502,011503 011504,011801	1/15/08 1/18/08	19,265	Nonhazardous
Tank 1 Load 20	Various waste streams	012901,012902 013001,013101	1/29/08 1/31/08	18,669	Nonhazardous
Tank 3 Load 19	Various waste streams	SCD081	2/04/08	Est.5000	Nonhazardous

4.5 Solid Waste Disposal

Solid wastes and sludges stored in IBCs at the Horton site were also field screened to determine a "hazardous" vs. "nonhazardous" classification for handling, transportation and disposal purposes. The solids were transferred from the decontamination pad, in most cases, into onsite, watertight, sludge boxes. For some IBCs that could not be moved, a vacuum truck was used to transfer sludges and/or solids into the sludge boxes. A composite sample from each sludge box was collected and submitted to SHEALY for analysis. This sampling was performed to ensure that field screening procedures utilized at the Horton site were correct in classifying each waste stream as nonhazardous. Each solid sample was analyzed for VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C and TAL metals. All metals were analyzed using EPA Method 6010B with the exception of mercury (EPA Method 7470A). In instances where total metals analyses indicated elevated concentrations of a metal where a regulatory limit for disposal had been established, another sample was collected and submitted for analysis of the particular metal in question using the toxicity characteristic leaching procedure (TCLP). A summary of the analytical data generated from the onsite sludge boxes is provided in Table 4-4. Laboratory analytical data sheets are provided on an attached computer disk.

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY

Compound	Sludge Box 001	Sludge Box 002	Sludge Box 003	Sludge Box 004	Sludge Box 005	Sludge Box 006	Sludge Box 007	Sludge Box 008	Sludge Box 009	Sludge Box 010	Sludge Box 011
VOCs											
1,1 Dichloroethene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	76	ND	2100	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/kg)	ND	ND	ND	480	ND	ND	ND	ND	ND	ND	67000
Acetone (ug/kg)	610	ND	ND	ND	ND	2900	ND	ND	5000	ND	ND
Benzene (ug/kg)	ND	ND	ND	ND	ND	ND	1000	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	ND	ND	ND	36	ND	ND	ND	ND	2300	ND	ND
Chloroform (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	ND	ND	ND	11	ND	6900	ND	ND	ND	ND	ND
Isopropylbenzene (ug/kg)	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/kg)	ND	ND	ND	ND	600	ND	10000	ND	2600	390	ND
Methylcyclohexane (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	ND	ND	ND	ND	17000	2800	ND	20000	4000	640	ND
Styrene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/kg)	ND	ND	94	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (ug/kg)	ND	ND	160	46	ND	29000	ND	ND	3000	ND	ND
Semi-VOCs											
2-Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	790000	ND	ND	ND	ND
Butyl benzyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam (ug/kg)	38000000	ND	ND	ND	ND	ND	350000	ND	ND	ND	ND
Di-n-butyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	33000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAL Metals											
Aluminum (mg/kg)	9200	3200	ND	2200	200000	3400	6300	4700	70000	6000	4600
Antimony (mg/kg)	1100	0.45	ND	3200	6500	0.76	83	2800	370	7.5	440
Arsenic (mg/kg)	2.2	0.49	ND	5	7.7	ND	ND	2.7	ND	2.3	ND
Barium (mg/kg)	67	24	ND	3.2	15	19	110	390	51	58	17
Beryllium (mg/kg)	ND	ND	ND	ND	2.8	ND	ND	ND	ND	2.2	ND
Cadmium (mg/kg)	ND	ND	ND	ND	0.63	ND	ND	ND	ND	0.41	ND
Chromium (mg/kg)	3.1	1.7	ND	3.6	4.8	2.6	13	4.9	12	18	6.2
Cobalt (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND
Copper (mg/kg)	11	2000	ND	8.3	14	18	85000	140	34	3500	6.1
Iron (mg/kg)	2900	300	ND	260	170	630	3400	770	8300	5300	2100
Lead (mg/kg)	1.8	1	ND	3.8	2.8	0.68	ND	2.9	7.4	4.4	ND
Magnesium (mg/kg)	17000	420	ND	1100	630	2000	ND	ND	4800	6700	2400
Manganese (mg/kg)	91	9	ND	7	7.5	31	40	13	130	90	40
Mercury (mg/kg)	ND	ND	ND	ND	ND	ND	23	ND	ND	ND	ND
Nickel (mg/kg)	250	ND	ND	ND	ND	ND	29	12	43	15	ND
Selenium (mg/kg)	ND	ND	ND	ND	3.1	0.52	ND	ND	ND	ND	ND
Silver (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND
Zinc (mg/kg)	1200	17	6.2	570	71	26	5200	280	2000	160	41000
Sample Date	1/19/07	2/2/07	1/29/07	2/12/07	2/14/07	2/22/07	3/2/07	3/7/07	3/16/07	3/21/07	3/28/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 012	Sludge Box 013	Sludge Box 014	Sludge Box 015	Sludge Box 016	Sludge Box 018	Sludge Box 017	Sludge Box 019	Sludge Box 020	Sludge Box 021
VOCs										
1,1 Dichloroethene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	180	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	1200	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone (ug/kg)	ND	ND	9000	4400	8600	ND	ND	900	1200	3200
Benzene (ug/kg)	ND	ND	ND	ND	ND	840	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	ND	ND	31000	ND	ND	ND	ND	ND	5600	ND
Chloroform (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	ND	ND	ND	6800	1600	2700	ND	ND	ND	ND
Isopropylbenzene (ug/kg)	ND	ND	ND	1100	1900	ND	ND	ND	ND	ND
Methyl acetate (ug/kg)	ND	ND	ND	930	ND	ND	820	ND	ND	ND
Methylcyclohexane (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	ND	ND	1900	ND	ND	ND	1000	ND	ND	ND
Styrene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/kg)	ND	ND	ND	ND	1100	8200	ND	ND	460	ND
Xylenes (ug/kg)	ND	ND	ND	28000	6500	15000	ND	ND	740	790
Semi-VOCs										
2-Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam (ug/kg)	ND	ND	1300000	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate (ug/kg)	ND	ND	ND	160000	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAL Metals										
Aluminum (mg/kg)	100	510	73000	1200	2100	4600	26000	120000	9600	380
Antimony (mg/kg)	ND	67	6500	570	2000	100	310	8000	700	630
Arsenic (mg/kg)	ND	ND	4	ND	2.9	ND	2.2	3.8	1.6	ND
Barium (mg/kg)	ND	ND	48	ND	ND	6.8	110	ND	ND	ND
Beryllium (mg/kg)	ND	ND	0.63	ND	ND	ND	ND	0.81	ND	ND
Cadmium (mg/kg)	ND	ND	0.28	ND	ND	ND	ND	0.44	ND	ND
Chromium (mg/kg)	ND	2.3	6	3.2	ND	11	19	1.2	ND	4.7
Cobalt (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper (mg/kg)	4.2	36	17	3.3	3.7	10	700	1.7	4.1	2.1
Iron (mg/kg)	140	980	2800	160	320	1100	5600	310	2500	200
Lead (mg/kg)	ND	ND	3.2	ND	ND	ND	3.3	1.5	ND	ND
Magnesium (mg/kg)	ND	ND	1500	ND	2500	ND	1400	1400	28000	ND
Manganese (mg/kg)	ND	11	29	2.8	20	8.7	30	8.9	170	6.4
Mercury (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel (mg/kg)	ND	480	13	ND	ND	25	6.3	ND	ND	ND
Selenium (mg/kg)	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND
Silver (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc (mg/kg)	28	28	57	890	1100	240	180	1100	800	430
Sample Date	3/30/07	4/4/07	4/05/07	4/11/07	4/13/07	4/17/07	4/18/07	4/20/07	4/24/07	4/24/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 022	Sludge Box 023	Sludge Box 024	Sludge Box 025	Sludge Box 026	Sludge Box 027	Sludge Box 028	Sludge Box 029	Sludge Box 030	Sludge Box 031
VOCs										
1,1 Dichloroethene (ug/kg)	3200	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	5200	ND	2700	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/kg)	ND	2100	1400	21000	ND	1700	580000	ND	ND	1400
Acetone (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	ND	ND	14000	330000	ND	ND	ND	ND	ND	870
Chloroform (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	ND	580	ND	2900	ND	ND	ND	ND	ND	ND
Isopropylbenzene (ug/kg)	ND	ND	ND	750	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/kg)	ND	ND	ND	15000	ND	ND	ND	ND	ND	ND
Methylcyclohexane (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	ND	1800	ND	140000	ND	16000	ND	ND	85000	5600
Styrene (ug/kg)	ND	ND	ND	5400	ND	ND	ND	ND	ND	ND
Toluene (ug/kg)	1600	680	ND	1600	ND	400	ND	ND	1500	ND
Xylenes (ug/kg)	ND	3200	480	13000	ND	430	ND	ND	ND	ND
Semi-VOCs										
2-Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/kg)	ND	790000	ND	11000	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	420000	ND
Caprolactam (ug/kg)	ND	ND	ND	ND	ND	180000	ND	ND	25000000	ND
Di-n-butyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	ND	950000	ND	6700	ND	ND	ND	ND	ND	ND
TAL Metals										
Aluminum (mg/kg)	16000	8200	1600	15000	ND	12000	97	300	3700	1400
Antimony (mg/kg)	6.4	460	44	260	ND	3000	7.6	18	250	850
Arsenic (mg/kg)	ND	ND	ND	ND	ND	4.9	0.57	ND	ND	1.2
Barium (mg/kg)	ND	110	ND	ND	ND	ND	ND	ND	11	9.7
Beryllium (mg/kg)	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium (mg/kg)	0.52	0.55	ND	ND	ND	ND	ND	ND	ND	ND
Chromium (mg/kg)	0.8	38	0.99	2.8	ND	26	21	1.6	ND	19
Cobalt (mg/kg)	ND	ND	ND	ND	ND	ND	ND	0.1	ND	ND
Copper (mg/kg)	0.67	19	1.8	4.6	ND	270	81	12	2.9	4.5
Iron (mg/kg)	840	5800	230	3500	ND	3100	460	800	780	490
Lead (mg/kg)	ND	11	ND	ND	ND	12	0.83	ND	1.8	12
Magnesium (mg/kg)	6300	6300	1200	30000	ND	2100	ND	ND	1500	ND
Manganese (mg/kg)	45	120	7.4	190	ND	45	5	5.1	12	6.7
Mercury (mg/kg)	ND	ND	ND	0.95	ND	ND	ND	ND	ND	ND
Nickel (mg/kg)	ND	27	ND	ND	ND	58	ND	ND	8.8	7
Selenium (mg/kg)	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND
Silver (mg/kg)	ND	ND	ND	ND	ND	0.96	0.062	ND	ND	ND
Vanadium (mg/kg)	ND	ND	ND	ND	ND	9.9	0.19	ND	ND	ND
Zinc (mg/kg)	2500	890	840	1100	ND	650	360	92	74	73
Sample Date	4/27/07	5/1/07	5/3/07	5/4/07	5/10/07	5/15/07	5/17/07	5/23/07	5/25/07	6/5/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 032	Sludge Box 033	Sludge Box 034	Sludge Box 035	Sludge Box 036	Sludge Box 037	Sludge Box 038	Sludge Box 039	Sludge Box 040	Sludge Box 041	Sludge Box 042
VOCs											
1,1 Dichloroethene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	ND	ND	1200	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone (ug/kg)	ND	ND	4000	ND	ND	ND	ND	ND	1000	1600	ND
Benzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	970	ND	ND	ND	ND	ND	ND	ND	ND	650	ND
Chloroform (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	250	ND	ND
Isopropylbenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/kg)	ND	320	ND	ND	260	150	ND	4700	37000	2300	ND
Methylcyclohexane (ug/kg)	ND	ND	670	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	1100	9100	ND	2300	4200	ND	ND	ND	1000	370	ND
Styrene (ug/kg)	ND	ND	ND	2500	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/kg)	300	500	ND	ND	ND	150	ND	ND	ND	ND	ND
Xylenes (ug/kg)	830	ND	ND	ND	280	130	ND	2500	1800	ND	ND
Semi-VOCs											
2-Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-Ethylhexyl)phthalate (ug/kg)	29000	ND	ND	ND	ND	ND	ND	ND	73000	600000	ND
Butyl benzyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam (ug/kg)	73000	1200000	55000	21000000	390000	200000	ND	ND	ND	280000	240000
Di-n-butyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAL Metals											
Aluminum (mg/kg)	3200	13000	220	470	200	8600	410	220	1300	5900	24000
Antimony (mg/kg)	36	700	16	100	2.7	ND	2.4	ND	5.9	120	1300
Arsenic (mg/kg)	1.6	ND	ND	ND	ND	ND	ND	ND	3.1	5.3	2.5
Barium (mg/kg)	57	56	ND	10	7.8	10	670	13	46	200	22
Beryllium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium (mg/kg)	0.34	ND	ND	ND	ND	0.11	ND	ND	1.1	1.6	ND
Chromium (mg/kg)	9.8	20	ND	49	2.4	18	7.3	3.1	12	38	6.6
Cobalt (mg/kg)	2.8	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND
Copper (mg/kg)	17	9.9	0.58	23	4	6.8	2300	5.1	43	160	11
Iron (mg/kg)	13000	810	47	1800	490	920	120	550	11000	28000	1000
Lead (mg/kg)	13	2.4	ND	ND	ND	12	5.5	ND	60	98	1.5
Magnesium (mg/kg)	1100	1300	ND	ND	ND	470	ND	ND	1500	2200	1900
Manganese (mg/kg)	100	8.1	ND	11	3.5	13	18	16	110	150	30
Mercury (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND
Nickel (mg/kg)	5.7	7.8	ND	ND	ND	14	ND	ND	10	21	18
Selenium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver (mg/kg)	0.7	ND	0.63	ND	ND	0.47	ND	ND	ND	ND	ND
Vanadium (mg/kg)	9.2	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc (mg/kg)	320	290	16	48	76	20000	380	110	420	1000	140
Sample Date	6/7/07	6/8/07	6/15/07	6/20/07	6/27/07	7/10/07	7/13/07	7/18/07	7/27/07	7/31/07	8/7/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 043	Sludge Box 044	Sludge Box 045	Sludge Box 046	Sludge Box 047	Sludge Box 048	Sludge Box 049	Sludge Box 050	Sludge Box 051	Sludge Box 052
VOCs										
1,1 Dichloroethene (ug/kg)	ND	ND	3500	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	ND	ND	ND	10000	ND	ND	760
4-Methyl-2-pentanone (ug/kg)	ND	84000	ND	ND	ND	ND	840	ND	ND	ND
Acetone (ug/kg)	ND	ND	ND	2200	7800	ND	3100	2200	ND	2200
Benzene (ug/kg)	ND	ND	ND	ND	2300	ND	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	ND	190000	1500	ND	5200	440	ND	ND	ND	1500
Isopropylbenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl acetate (ug/kg)	2300	ND	1600	ND	ND	ND	430	3700	1800	780
Methylcyclohexane (ug/kg)	ND	46000	ND	ND	1200	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	2400	ND	ND	ND	ND	2100	ND	ND	ND	9600
Styrene (ug/kg)	ND	ND	2500	ND	ND	ND	ND	ND	38000	ND
Toluene (ug/kg)	ND	520000	10000	ND	14000	ND	ND	ND	ND	2300
Xylenes (ug/kg)	ND	910000	6900	ND	27000	2100	ND	ND	ND	6600
Semi-VOCs										
2-Methylphenol (ug/kg)	ND	580000	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-Ethylhexyl)phthalate (ug/kg)	48000	ND	140000	830000	ND	10000000	ND	10000000	140000	ND
Butyl benzyl phthalate (ug/kg)	ND	ND	890000	ND	ND	ND	ND	ND	ND	ND
Caprolactam (ug/kg)	ND	ND	1500000	ND	ND	ND	ND	ND	ND	3500000
Di-n-butyl phthalate (ug/kg)	ND	ND	150000	ND	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	220000	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	ND	100000	1000000	ND	ND	1400000	ND	17000	ND	ND
TAL Metals										
Aluminum (mg/kg)	2700	3100	3000	4300	8200	4200	2400	3500	630	700
Antimony (mg/kg)	330	200	45	230	2600	34	5.7	24000	4.8	350
Arsenic (mg/kg)	ND	1.7	ND	0.7	2.9	ND	ND	31	ND	ND
Barium (mg/kg)	50	130	58	83	170	3200	500	220	ND	ND
Beryllium (mg/kg)	ND	ND	ND	0.84	ND	ND	ND	0.89	ND	ND
Cadmium (mg/kg)	0.41	0.49	4.6	0.2	ND	ND	ND	2.2	ND	0.18
Chromium (mg/kg)	16	15	110	12	ND	11	11	7.3	9.5	2.3
Cobalt (mg/kg)	ND	160	37	5.6	ND	ND	ND	5.8	10	26
Copper (mg/kg)	41	77	600	9.5	25	65	34	60	10	26
Iron (mg/kg)	3200	3100	39000	7800	570	13000	6600	9500	2600	1300
Lead (mg/kg)	8.3	23	130	7.8	ND	88	14	66	26	12
Magnesium (mg/kg)	810	1500	4100	3900	980	880	1100	2500	900	4800
Manganese (mg/kg)	36	60	230	63	9	23	63	110	26	12
Mercury (mg/kg)	ND	ND	0.28	ND	ND	ND	ND	0.41	ND	ND
Nickel (mg/kg)	6.1	7.5	84	7.6	ND	24	11	17	4.8	5.5
Selenium (mg/kg)	ND	1	ND	ND	ND	1	1.1	1.3	ND	ND
Silver (mg/kg)	ND	ND	9.1	ND	ND	0.46	2.2	ND	ND	ND
Vanadium (mg/kg)	ND	10	ND	13	ND	ND	5	14	ND	ND
Zinc (mg/kg)	330	160	1300	190	84	1300	730	890	110	460
Sample Date	8/10/07	8/16/07	8/22/07	8/30/07	9/6/07	9/19/07	9/25/07	9/28/07	10/3/07	10/10/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 053	Sludge Box 054	Sludge Box 055	Sludge Box 056	Sludge Box 057	Sludge Box 058	Sludge Box 059	Sludge Box 060	Sludge Box 061	Sludge Box 062
VOCs										
1,1 Dichloroethene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK) (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone (ug/kg)	4200	4100	ND	ND	ND	28000	15000	ND	ND	ND
Benzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide (ug/kg)	ND	23000	ND	3400	ND	ND	3000	ND	ND	ND
Chloroform (ug/kg)	ND	730	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene (ug/kg)	2700	1600	590	ND	ND	ND	ND	ND	950	ND
Isopropylbenzene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	390	ND
Methyl acetate (ug/kg)	5200	3500	6100	1600	ND	ND	ND	ND	ND	ND
Methylcyclohexane (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride (ug/kg)	3400	11000	12000	ND	ND	3500	8400	1000	5500	ND
Styrene (ug/kg)	ND	ND	ND	ND	ND	1400	1500	ND	ND	ND
Toluene (ug/kg)	7400	3700	1500	ND	2300	1400	ND	ND	1100	ND
Xylenes (ug/kg)	14000	7300	2400	1000	1200	4800	ND	ND	3500	ND
Semi-VOCs										
2-Methylphenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3 & 4 Methylphenol (ug/kg)	ND	ND	740000	ND	ND	ND	ND	ND	ND	ND
Bis (2-Ethylhexyl)phthalate (ug/kg)	14000000	330000	46000	ND	ND	170000	ND	ND	ND	ND
Caprolactam (ug/kg)	5000000	18000000	140000	6900000	ND	ND	1200000	ND	ND	200000000
Di-n-butyl phthalate (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol (ug/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAL Metals										
Aluminum (mg/kg)	57000	44000	9400	58000	140	4700	25000	990	6600	680
Antimony (mg/kg)	1400	1700	42	2300	4.7	3400	13000	30	ND	200
Arsenic (mg/kg)	2.5	2.5	ND	ND	ND	6.2	7.6	ND	ND	1.6
Barium (mg/kg)	530	67	1100	52	ND	ND	ND	ND	ND	ND
Beryllium (mg/kg)	ND	0.58	ND	0.76	ND	ND	ND	ND	ND	ND
Cadmium (mg/kg)	0.33	ND	ND	0.32	ND	ND	ND	0.8	ND	ND
Chromium (mg/kg)	13	6.9	5.1	4.4	ND	9.4	ND	1.9	28	4.9
Cobalt (mg/kg)	ND	37	ND	ND	ND	ND	ND	ND	ND	ND
Copper (mg/kg)	32	15	15	6.6	4.5	33	22	9.8	6.3	4.3
Iron (mg/kg)	7300	2200	5000	1100	430	3800	810	1200	8500	1200
Lead (mg/kg)	12	4.8	4.1	ND	ND	8.2	4.1	2.1	ND	1.7
Magnesium (mg/kg)	7800	7900	4900	830	ND	2200	2000	5200	ND	ND
Manganese (mg/kg)	38	26	81	17	6.9	54	24	38	36	12
Mercury (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel (mg/kg)	9.7	12	39	10	ND	ND	ND	ND	ND	ND
Selenium (mg/kg)	ND	ND	ND	ND	ND	4.3	ND	ND	ND	ND
Silver (mg/kg)	ND	ND	ND	ND	ND	ND	ND	16	ND	ND
Vanadium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc (mg/kg)	510	320	1200	180	22	14000	310	2200	250	120
Sample Date	10/18/07	10/18/07	10/25/07	11/1/07	11/9/07	11/14/07	11/21/07	11/30/07	12/10/07	12/18/07

TABLE 4-4: SLUDGE BOX WASTE ANALYTICAL DATA SUMMARY (Continued)

Compound	Sludge Box 063	Sludge Box 064	Sludge Box 065						
VOCs									
1,1 Dichloroethene (ug/kg)	ND	ND	ND						
1,2 Dichlorobenzene (ug/kg)	ND	ND	ND						
2-Butanone (MEK) (ug/kg)	ND	ND	ND						
4-Methyl-2-pentanone (ug/kg)	ND	ND	ND						
Acetone (ug/kg)	ND	ND	140						
Benzene (ug/kg)	ND	ND	ND						
Carbon Disulfide (ug/kg)	ND	ND	ND						
Chloroform (ug/kg)	ND	ND	ND						
Ethylbenzene (ug/kg)	ND	ND	ND						
Isopropylbenzene (ug/kg)	97000	ND	ND						
Methyl acetate (ug/kg)	ND	ND	ND						
Methylcyclohexane (ug/kg)	ND	ND	ND						
Methylene chloride (ug/kg)	ND	ND	ND						
Styrene (ug/kg)	ND	ND	ND						
Toluene (ug/kg)	ND	ND	ND						
Xylenes (ug/kg)	27000	ND	19						
Semi-VOCs									
3 & 4 Methylphenol (ug/kg)	ND	ND	ND						
Bis (2-Ethylhexyl)phthalate (ug/kg)	ND	ND	89000						
Butyl benzyl phthalate (ug/kg)	ND	ND	ND						
Caprolactam (ug/kg)	73000	1300000	1400000						
Naphthalene (ug/kg)	ND	ND	ND						
Phenol (ug/kg)	ND	ND	ND						
TAL Metals									
Aluminum (mg/kg)	40000	4200	2100						
Antimony (mg/kg)	ND	5	120						
Arsenic (mg/kg)	12	ND	2						
Barium (mg/kg)	96	210	110						
Beryllium (mg/kg)	ND	ND	ND						
Cadmium (mg/kg)	ND	ND	0.18						
Chromium (mg/kg)	40	15	42						
Cobalt (mg/kg)	ND	ND	2.1						
Copper (mg/kg)	23	30	110						
Iron (mg/kg)	66000	4400	5500						
Lead (mg/kg)	27	ND	13						
Magnesium (mg/kg)	ND	ND	610						
Manganese (mg/kg)	280	37	34						
Mercury (mg/kg)	ND	ND	ND						
Nickel (mg/kg)	ND	ND	25						
Selenium (mg/kg)	ND	ND	ND						
Silver (mg/kg)	ND	ND	0.98						
Vanadium (mg/kg)	160	ND	5						
Zinc (mg/kg)	400	ND	370						
Sample Date	10/18/07	10/18/07	10/25/07						

ND – Not Detected

Upon receipt of the laboratory data, the information was submitted to personnel at Vopak for review. During the Horton Removal Action project, 725.04 tons of solid and sludge were shipped to Vopak as nonhazardous waste for disposal. A summary of solid / sludge waste disposal activities during the Horton Site project is provided in Table 4-5. Copies of the solid / sludge waste disposal manifests are provided in Appendix C.

4.6 Hazardous Waste Disposal

Field screening activities identified several IBCs containing liquids with a pH of less than 2 or greater than 12.5. After bench scale testing, these liquids were successfully neutralized and transferred into onsite frac tanks for disposal as nonhazardous wastes. Liquids failing the 500 ppm field screening for VOCs were submitted to SHEALY for flash point testing. In the event that the samples were determined to have a flash point above 140° F, the liquids were transferred into onsite frac tanks for disposal as nonhazardous wastes. However, six IBCs were determined to contain liquids with a flash point of less than 140° F. These liquids were transferred to appropriate drums and shipped to the Clean Harbors located in Baltimore, Maryland for disposal as a hazardous waste.

Laboratory analyses of five frac tanks indicated the presence of one or more compounds at concentrations that required disposal of the liquids as a hazardous waste based on toxicity. A total of 84,970 gallons of liquid were transported to the Clean Harbors facility and Michigan Disposal Waste Treatment Plant located in Belleville, Michigan for final disposal as a hazardous waste.

TABLE 4-5
SOLID / SLUDGE DISPOSAL SUMMARY

Disposal Date	Load Number	Disposal Facility	Waste Classification	Tons
1/29/2007	L-001	VOPAK	Non Hazardous	6.72
2/07/2007	L-002	VOPAK	Non Hazardous	2.08
2/14/2007	L-003	VOPAK	Non Hazardous	6.09
2/21/2007	L-004	VOPAK	Non Hazardous	2.51
2/26/2007	L-005	VOPAK	Non Hazardous	4.57
3/06/2007	L-006	VOPAK	Non Hazardous	10.65
3/13/2007	L-007	VOPAK	Non Hazardous	8.04
3/16/2007	L-008	VOPAK	Non Hazardous	11.21
3/27/2007	L-009	VOPAK	Non Hazardous	11.18
3/30/2007	L-010	VOPAK	Non Hazardous	11.02
4/04/2007	L-011	VOPAK	Non Hazardous	14.18
4/06/2007	L-012	VOPAK	Non Hazardous	12.58
4/12/2007	L-013	VOPAK	Non Hazardous	7.61
4/16/2007	L-014	VOPAK	Non Hazardous	13.73
4/17/2007	L-015	VOPAK	Non Hazardous	13.16
4/20/2007	L-016	VOPAK	Non Hazardous	13.01
4/25/2007	L-017	VOPAK	Non Hazardous	8.54
4/25/2007	L-018	VOPAK	Non Hazardous	13.00
4/26/2007	L-019	VOPAK	Non Hazardous	11.86
5/01/2007	L-020	VOPAK	Non Hazardous	14.85
5/02/2007	L-021	VOPAK	Non Hazardous	13.28
5/08/2007	L-022	VOPAK	Non Hazardous	12.59
5/10/2007	L-023	VOPAK	Non Hazardous	8.85
5/10/2007	L-024	VOPAK	Non Hazardous	13.21
5/14/2007	L-025	VOPAK	Non Hazardous	13.29
5/17/2007	L-026	VOPAK	Non Hazardous	11.88
5/24/2007	L-027	VOPAK	Non Hazardous	10.67
5/31/2007	L-028	VOPAK	Non Hazardous	12.82
5/31/2007	L-029	VOPAK	Non Hazardous	10.03
6/01/2007	L-030	VOPAK	Non Hazardous	12.21
6/13/2007	L-031	VOPAK	Non Hazardous	11.16
6/21/2007	L-032	VOPAK	Non Hazardous	10.44
6/20/2007	L-033	VOPAK	Non Hazardous	10.24
6/26/2007	L-034	VOPAK	Non Hazardous	12.11
6/29/2007	L-035	VOPAK	Non Hazardous	10.46
7/09/2007	L-036	VOPAK	Non Hazardous	11.31
7/18/2007	L-037	VOPAK	Non Hazardous	9.98
7/24/2007	L-038	VOPAK	Non Hazardous	11.73
8/01/2007	L-039	VOPAK	Non Hazardous	11.29
8/08/2007	L-040	VOPAK	Non Hazardous	10.20
8/08/2007	L-041	VOPAK	Non Hazardous	11.64
8/14/2007	L-042	VOPAK	Non Hazardous	11.73

TABLE 4-5
SOLID / SLUDGE DISPOSAL SUMMARY (Continued)

Disposal Date	Load Number	Disposal Facility	Waste Classification	Tons
8/21/2007	L-043	VOPAK	Non Hazardous	12.01
8/29/2007	L-044	VOPAK	Non Hazardous	11.01
9/07/2007	L-045	VOPAK	Non Hazardous	9.77
9/14/2007	L-046	VOPAK	Non Hazardous	9.13
9/19/2007	L-047	VOPAK	Non Hazardous	13.00
10/04/2007	L-048	VOPAK	Non Hazardous	12.30
10/04/2007	L-049	VOPAK	Non Hazardous	8.13
10/09/2007	L-050	VOPAK	Non Hazardous	12.05
10/17/2007	L-051	VOPAK	Non Hazardous	13.26
10/18/2007	L-052	VOPAK	Non Hazardous	11.49
11/01/2007	L-053	VOPAK	Non Hazardous	14.94
11/08/2007	L-054	VOPAK	Non Hazardous	14.73
11/09/2007	L-055	VOPAK	Non Hazardous	13.26
11/15/2007	L-056	VOPAK	Non Hazardous	14.03
11/27/2007	L-057	VOPAK	Non Hazardous	15.92
12/05/2007	L-058	VOPAK	Non Hazardous	12.45
12/05/2007	L-059	VOPAK	Non Hazardous	12.93
12/14/2007	L-060	VOPAK	Non Hazardous	12.59
1/08/2008	L-061	VOPAK	Non Hazardous	13.22
1/08/2008	L-062	VOPAK	Non Hazardous	12.49
1/18/2008	L-063	VOPAK	Non Hazardous	9.92
1/24/2008	L-064	VOPAK	Non Hazardous	7.27
2/07/2008	L-065	VOPAK	Non Hazardous	11.43
Total				725.04

TABLE 4-6
HAZARDOUS WASTE DISPOSAL SUMMARY

Frac Tank #	Disposal Facility	Manifest Numbers	Disposal Date	Disposal Volume (gal.)	Waste Characterization
Tank 1 Load 01	Clean Harbors Baltimore, MD	000890689FLE 000890690FLE 000890691FLE 000890692FLE	3/19/07 3/19/07 3/22/07 3/22/07	5,000 5,000 5,000 2,800	Hazardous
Tank 3 Load 08	Michigan Disposal Waste Treat. Plant Belleville, MI	000272142 000272141 000272140	7/13/07 7/17/07 7/12/07	5,373 3,619 5,194	Hazardous
Tank 2 Load 16	Michigan Disposal Waste Treat. Plant Belleville, MI	0272123 0272126 0272124 0272125	10/08/07 10/09/07 10/10/07	4,993 4,832 4,984 1,565	Hazardous
Tank 1 Load 15	Michigan Disposal Waste Treat. Plant Belleville, MI	0272119 0272120 0272122 0272121	10/19/07 10/22/07 10/25/07 10/30/07	5,300 4,995 2,407 4,638	Hazardous
Tank 2 Load 18	Clean Harbors Baltimore, MD	000272115 000272116 000272117 000272118 000629690 FLE	11/26/07 11/26/07 11/26/07 11/27/07 11/28/07	4,800 4,800 4,870 4,700 100	Hazardous
Total				84,970	
+ 6 drums	Clean Harbors	000710592 FLE	[illegible]	3000	Hazardous

4.7 Metal Cage Disposal

Metal cages were present both attached to IBCs and empty. As stated previously, a metal cage database was developed during this project. Once all information present had been recorded, the cage was transferred to a designated area, crushed and placed into an onsite rolloff box. Eight thousand five hundred twenty (8,520) metal cages were processed during the Horton Removal Project. Once each rolloff box was full, the crushed cages were transported to Carolina Recycling Group in Wellman, South Carolina for recycling.

Section 5.0
Soil Assessment

SECTION 5.0

SOIL CONTAMINATION ASSESSMENT

5.1 Objective and Scope of Investigation

A Soil Sampling & Analysis Work Plan dated January 8, 2008 was prepared for the Horton site. The objectives of the Work Plan were as follows:

- Identify soil sampling locations;
- Define proposed soil collection procedures;
- Define site-specific laboratory analyses that would identify onsite soil contamination, if present;
- Define screening limits to determine whether soil contamination is present, and
- Provide procedures for soil excavation, removal and offsite disposal in the event that surficial soil contamination was identified.

5.2 Soil Sample Locations & Frequency

General Approach

Several different approaches were examined for selection of soil sampling locations during the preparation of the Work Plan. As described within the RCRA Facility Investigation (RFI) Guidance Document dated May 1989, general sampling considerations for the Piedmont site included:

- Representativeness – The selected method should be capable of providing a true representation of the situation under investigation.

- Compatibility with Analytical Considerations – Special consideration should be given to the selection of sampling methods and equipment to prevent adverse effects during analysis.

- Practicality - The selected method should stress the use of practical, proven procedures.

- Simplicity – The proposed sampling procedures should be relatively easy to follow and equipment simple to operate.

- Safety – The proposed sampling procedures should be safe to implement.

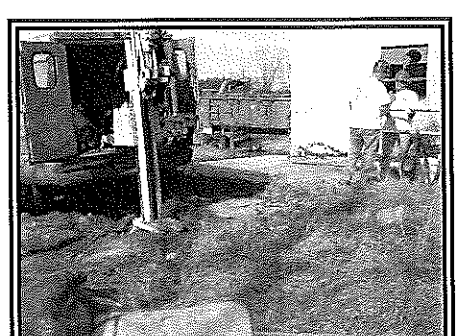
Three general approaches to selecting sampling locations were considered during preparation of the Work Plan. While a brief description of each approach is provided within this document, a more detailed discussion of each approach can be found in the RFI Guidance Document dated May 1989. The three approaches considered were as follows:

- Judgmental Sampling – Sample collection locations are based on existing knowledge of waste storage / handling practices at a site.
- Systematic Sampling - Sample collection locations are established using a predetermined scheme (i.e. sampling along a line or grid).
- Random Sampling - Sample collection locations are established using a randomized scheme (i.e. random number generator, etc.).

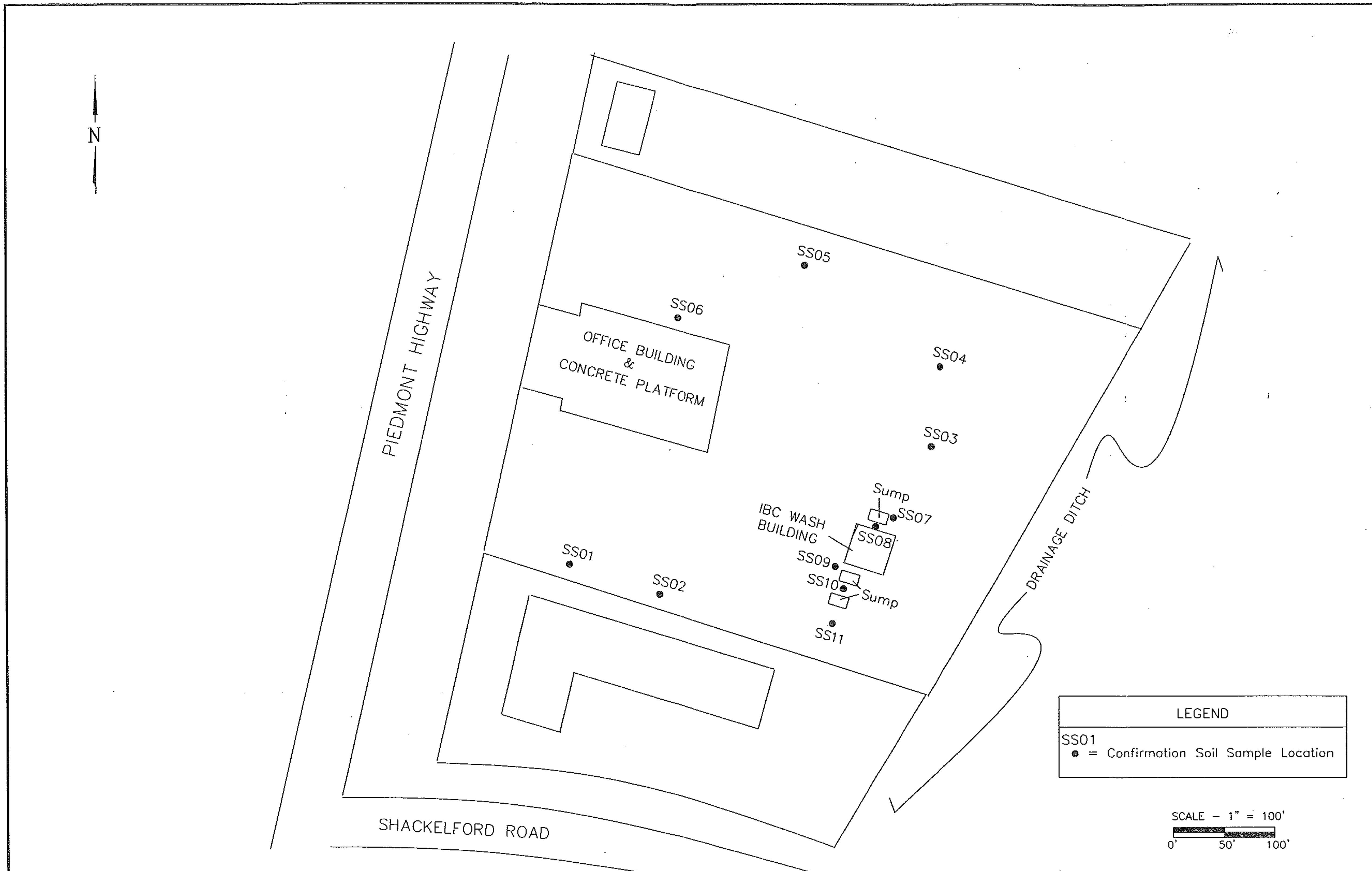
Selection of a particular approach depends primarily on the level of knowledge regarding a release. At the Piedmont site, waste handling / cleaning procedures conducted by Horton Sales were reportedly performed primarily within one onsite building. Additionally, IBCs were staged in specific areas across the site. Due to the fact that waste handling and container storage activities were concentrated in specific areas at the Piedmont site, the judgmental sampling approach was selected for the assessment of soil contamination. The approach focused soil sampling activities in specific areas that were considered most likely to be contaminated, if soil contamination was present. Soil samples were selected from the following locations: (1) areas where IBCs were previously staged and the asphalt pavement was damaged or missing, (2) soils adjacent to the onsite, former, waste handling building and (3) adjacent to onsite sumps.

Soil Sample Locations

Eleven (11) surficial soil samples were collected on January 11, 2008 from the areas where IBCs were previously staged or handled. Five soil sample locations were collected in the general area of the former waste handling building and waste water sumps. Additionally, two soil samples were collected from the former IBC storage areas located across the subject property. The location of each soil sample is shown in Figure 5-1.



Soil Sample Collection Using a GeoProbe Rig



HORTON SALES DEVELOPMENT SITE
1870 PIEDMONT HWY
GREENVILLE, SOUTH CAROLINA

FIGURE 5-1:
CONFIRMATION SOIL SAMPLE LOCATIONS

KSG
KLEEN SITES GEOSERVICES

D:\KSG\CAD\2006\06655\FINAL REPORT\Fig 5-1

5.3 Soil Sampling Procedures

Reports of previous waste handling and storage activities at the Piedmont site indicated that these actions were conducted at or above ground surface, with the exception of the sumps. During IBC removal operations by NES personnel, no evidence of buried containers or wastes was observed. It was assumed that any contamination at the site should be present within near surface soils. Therefore, initial contamination assessment activities were limited to the surficial soil horizon.

Two basic types of soil samples, composite and grab, can be utilized during a contamination assessment of surficial soils. Use of composite samples typically allows detection of contamination over an area of concern with a smaller number of samples. Compositing involves pooling and homogenization of multiple soil samples. The composite is then analyzed to give an average value for soil contamination in that area. However, the process of mixing individual soil samples can volatilize any VOC contaminants that might be present.

Due to the fact that VOC compounds were identified within the wastes that required disposal during IBC removal activities, compositing of soil samples was not proposed at the Piedmont site. Instead, the collection of individual "grab" samples was proposed for this project. Due to the compacted nature of surficial soils at the Piedmont site, a truck-mounted GeoProbe® rig was utilized for soil sampling purposes. Continuous, undisturbed soil samples were collected using the GeoProbe® rig from surface down to depths of three to nine feet, depending on the sampling location. Sample collection using this technique minimized the agitation of soils during the boring process. Descriptions of the soil sampling procedures used at sump and non-sump areas are provided as follows.

<u>Former IBC Storage Area Locations</u>

A South Carolina licensed well drilling contractor employed by Redox Tech, LLC was used for all drilling activities at the Piedmont site. Using the Geoprobe® rig, undisturbed soil samples were collected in 3-foot long, clear plastic tubes. These clear tubes allowed the onsite KSG field geologist to inspect each sample for discoloration over the upper 3 feet of the soil horizon. In boreholes where soil discoloration was observed, a grab sample was collected from the discolored interval. In the event that soil discoloration was not observed, a soil sample was collected from the portion of the sample tube representing the soil horizon ranging from 4 to 6 inches below ground surface. Soils in the upper two inches of the soil horizon were not sampled due to the fact that prolonged exposure to air and precipitation could significantly reduce any VOC contamination present.

Once the appropriate soil horizon was selected, a stainless-steel sampling spoon was used to transfer soils from the plastic tube into laboratory-supplied bottles. Care was taken to minimize soil agitation during the sampling process to prevent loss of any VOCs present.

Sump Locations

At locations adjacent to waste water sumps, the Geoprobe® rig was used to collect undisturbed soil samples from surface to depths ranging from 6 to 9 feet in the 3-foot long, clear plastic tubes. The KSG field geologist inspected the samples for discoloration in soils from surface down to the base of the sump. In the event that soil discoloration was observed, a grab sample was collected from the discolored interval. In the event that soil discoloration was not observed, a sample was collected from the portion of the tube representing the soil horizon at the base of the sump.

Once the appropriate soil horizon had been selected, a stainless-steel sampling spoon was used to transfer soils from the plastic tube into laboratory-supplied bottles. Care was taken to minimize soil agitation during the sampling process to prevent loss of any VOCs present. Laboratory analyses for each soil sample are discussed in Section 5.4.

5.4 Soil Analyses

Each soil sample collected at the Piedmont site was placed into laboratory-supplied bottles and packaged in an ice-filled cooler. Each sample was submitted to SHEALY for the following analyses: VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C and TAL metals. These analyses were selected due to the fact that VOCs, semi-VOCs and several metals on the target analyte list were all identified within the waste streams that required handling and disposal at the Piedmont site.

5.5 Equipment Decontamination Procedures

Geoprobe® tools and sampling equipment used during the investigation were decontaminated prior to and after use by utilizing the following procedures:

- Clean water rinse immediately after use;
- Nonphosphate detergent (Alconox) scrub with brushes;
- Clean water rinse;
- Deionized water rinse; and
- Air dry.

Implements used for the collection of samples for metals analysis required the following decontamination procedures;

- Clean water rinse immediately after use;
- Nonphosphate detergent (Alconox) scrub with brushes;
- Rinse with tap water;
- Rinse with dilute (0.1 N) hydrochloric or nitric acid;
- Rinse with reagent water; and
- Aluminum foil wrap (if not used immediately).

All Geoprobe® drill equipment decontamination liquids were collected within a plastic container. The decontamination fluids were added to a bulk liquid storage container for subsequent disposal.

5.6 Contamination Screening Criteria

One of the most important decisions in any soil sampling and analysis program is deciding what constitutes a "contaminated" sample. This task is complicated by the fact that naturally-occurring levels of one or more of the TAL metals are present in most soil samples. Therefore, it is important to utilize a procedure that allows a distinction between naturally-occurring concentrations of metals in soils and elevated metal concentrations that are present as a result of a release at the site.

Two major approaches to the determination of soil "screening" criteria are commonly utilized during contamination investigations. The first approach involves the collection of one or more background samples to develop a baseline for the concentrations of compounds, chemicals and/or metals that are naturally-occurring in the area of concern. This approach provides a site-specific database to compare against soil samples that are collected from the potentially contaminated area. Unfortunately, this technique does not account for the fact that soil is a very inhomogeneous matrix. It is possible to find highly varying concentrations of naturally-occurring metals in soil samples that are taken in close proximity to one another.

A second approach in establishing site "screening" criteria involves the use of established, risk-based concentrations, including preliminary remediation goals (PRGs). PRGs for CERCLA and RCRA sites are risk-based concentrations, derived from standardized equations combining exposure information and EPA toxicity data. PRGs are considered by the EPA to be protective for humans over a lifetime. However, PRGs do not address non-human health endpoints such as ecological impacts.

As stated within EPA's Region IX information bulletin concerning PRGs (i.e. PRGs: Frequently Asked Questions), the PRGs role in site "screening" is to help identify areas, contaminants and conditions that do not require further regulatory attention at a particular site. Generally, at sites where contaminant concentrations fall below PRGs, no further action or study is warranted. Chemical concentrations above the PRG would not automatically designate a site as "contaminated" or trigger cleanup activities. However, the exceedance of a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate.

Based on the past industrial use of the Piedmont site and the commercial nature of the surrounding properties, the use of PRGs for "screening" soil samples collected at the Horton site was adopted for this project. EPA Region IX has established PRGs for a wide range of organic and inorganic compounds. It should be noted that these PRGs are generic and were calculated without site-specific data. However, for substances that cause both cancer and noncancer effects, a concentration corresponding to a 10^{-6} (i.e. one-in-a-million) cancer risk was established by the EPA as the PRG. Therefore, data generated during the Piedmont site soil assessment was "screened" using the Region IX PRGs in both the "industrial" and "residential" soil categories. It should be noted that PRG values have not been established for calcium, magnesium, potassium and sodium. While soil concentrations were reported for each for these four metals, this data is presented for informational purposes only. Data from the analysis of calcium, magnesium, potassium and sodium was not used for soil "screening" purposes. A summary of the soil analytical data generated during this investigation is provided in Table 5-1. For ease of review, only VOC and semi-VOC compounds that were reported at concentrations above instrument detection limits are included in this table. Laboratory data sheets for each soil analysis are provided on an attached computer disk.

TABLE 5-1
CONFIRMATION SOIL SAMPLE ANALYTICAL DATA SUMMARY

Compound	Sample SS01	Sample SS02	Sample SS03	Sample SS04	Residential *PRG	Industrial *PRG
VOCs						
Acetone (ug/kg)	ND	29	ND	ND	1,600,000	6,000,000
2-Butanone (ug/kg)	ND	9.7	ND	ND	N/A	N/A
SVOCs						
Carbazole (ug/kg)	ND	ND	ND	ND	24,000	86,000
Metals						
Aluminum (mg/kg)	42,000	31,000	58,000	28,000	76,000	100,000
Antimony (mg/kg)	ND	ND	ND	ND	31	410
Arsenic (mg/kg)	3.9	3.1	4.7	2.8	22	260
Barium (mg/kg)	59	69	42	54	5,400	67,000
Beryllium (mg/kg)	ND	ND	ND	0.49	150	1,900
Cadmium (mg/kg)	ND	ND	ND	ND	37	450
Calcium (mg/kg)	ND	ND	ND	290	N/A	N/A
Chromium (mg/kg)	19	17	29	15	210	450
Cobalt (mg/kg)	ND	ND	ND	ND	900	1,900
Copper (mg/kg)	7.6	6.4	12	5.6	3,100	41,000
Iron (mg/kg)	17,000	14,000	**35,000**	11,000	23,000	100,000
Lead (mg/kg)	19	18	18	18	150	750
Magnesium (mg/kg)	ND	ND	ND	470	N/A	N/A
Manganese (mg/kg)	86	220	28	21	1,800	19,000
Mercury (mg/kg)	ND	ND	ND	ND	23	310
Nickel (mg/kg)	ND	ND	ND	5.8	1,600	20,000
Potassium (mg/kg)	ND	ND	ND	720	N/A	N/A
Selenium (mg/kg)	ND	ND	ND	ND	390	5,100
Silver (mg/kg)	ND	ND	ND	ND	390	5,100
Sodium (mg/kg)	ND	ND	ND	ND	N/A	N/A
Thallium (mg/kg)	ND	ND	ND	ND	5.2	67
Vanadium (mg/kg)	38	28	67	29	550	7,200
Zinc (mg/kg)	60	57	47	48	23,000	100,000
Sample Date	01/11/08	01/11/08	01/11/08	01/11/08		

PRG – USEPA Region IX Preliminary Remediation Goal
Bold type – Analysis exceeds Residential PRG
N/A – Not Applicable (PRG values do not exist)
ND – Compound was not detected

TABLE 5-1
CONFIRMATION SOIL SAMPLE
ANALYTICAL DATA SUMMARY

Compound	Sample SS05	Sample SS06	Sample SS07	Sample SS08	Residential *PRG	Industrial *PRG
VOCs						
Acetone (ug/kg)	ND	ND	ND	ND	1,600,000	6,000,000
2-Butanone (ug/kg)	ND	ND	ND	ND	N/A	N/A
SVOCs						
Carbazole (ug/kg)	ND	560	ND	ND	24,000	86,000
Metals						
Aluminum (mg/kg)	40,000	43,000	13,000	49,000	76,000	100,000
Antimony (mg/kg)	ND	ND	ND	ND	31	410
Arsenic (mg/kg)	2.4	2.5	1.8	**24**	22	260
Barium (mg/kg)	52	45	42	140	5,400	67,000
Beryllium (mg/kg)	ND	ND	0.36	1.5	150	1,900
Cadmium (mg/kg)	ND	ND	ND	2.4	37	450
Calcium (mg/kg)	780	580	330	ND	N/A	N/A
Chromium (mg/kg)	18	18	8.2	140	210	450
Cobalt (mg/kg)	ND	ND	ND	ND	900	1,900
Copper (mg/kg)	6.8	5.5	3.1	37	3,100	41,000
Iron (mg/kg)	16,000	14,000	6,100	**36,000**	23,000	100,000
Lead (mg/kg)	18	22	11	**170**	150	750
Magnesium (mg/kg)	1,100	ND	350	ND	N/A	N/A
Manganese (mg/kg)	86	28	60	170	1,800	19,000
Mercury (mg/kg)	ND	ND	ND	ND	23	310
Nickel (mg/kg)	6.1	7.1	2.9	15	1,600	20,000
Potassium (mg/kg)	1,700	800	380	ND	N/A	N/A
Selenium (mg/kg)	ND	ND	ND	ND	390	5,100
Silver (mg/kg)	ND	ND	ND	ND	390	5,100
Sodium (mg/kg)	ND	ND	ND	ND	N/A	N/A
Thallium (mg/kg)	ND	ND	ND	ND	5.2	67
Vanadium (mg/kg)	46	35	13	62	550	7,200
Zinc (mg/kg)	40	44	20	240	23,000	100,000
Sample Date	01/11/08	01/11/08	01/11/08	01/11/08		

PRG – USEPA Region IX Preliminary Remediation Goal
Bold type – Analysis exceeds Residential PRG
N/A – Not Applicable (PRG values do not exist)
ND – Compound was not detected

TABLE 5-1
CONFIRMATION SOIL SAMPLE
ANALYTICAL DATA SUMMARY

Compound	Sample SS09	Sample SS10	Sample SS10D	Sample SS11	Residential *PRG	Industrial *PRG
VOCs						
Acetone (ug/kg)	31	37	23	16	1,600,000	6,000,000
2-Butanone (ug/kg)	ND	11	8.8	ND	N/A	N/A
Methylcyclohexane (ug/kg)	ND	ND	ND	7.0	2,600,000	8,700,000
SVOCs						
Carbazole (ug/kg)	ND	ND	ND	ND	24,000	86,000
Metals						
Aluminum (mg/kg)	62,000	13,000	12,000	37,000	76,000	100,000
Antimony (mg/kg)	ND	ND	ND	ND	31	410
Arsenic (mg/kg)	4.9	1.8	2.2	2.6	22	260
Barium (mg/kg)	80	43	37	62	5,400	67,000
Beryllium (mg/kg)	ND	0.37	0.35	0.55	150	1,900
Cadmium (mg/kg)	ND	ND	ND	ND	37	450
Calcium (mg/kg)	ND	360	ND	ND	N/A	N/A
Chromium (mg/kg)	29	7.4	6.5	16	210	450
Cobalt (mg/kg)	ND	ND	ND	ND	900	1,900
Copper (mg/kg)	10	3.2	2.7	3.8	3,100	41,000
Iron (mg/kg)	28,000	5,800	4,200	5,700	23,000	100,000
Lead (mg/kg)	20	12	12	23	150	750
Magnesium (mg/kg)	ND	360	ND	470	N/A	N/A
Manganese (mg/kg)	38	41	30	19	1,800	19,000
Mercury (mg/kg)	ND	ND	ND	ND	23	310
Nickel (mg/kg)	ND	2.9	2.8	6.8	1,600	20,000
Potassium (mg/kg)	ND	410	310	740	N/A	N/A
Selenium (mg/kg)	ND	ND	ND	ND	390	5,100
Silver (mg/kg)	ND	ND	ND	ND	390	5,100
Sodium (mg/kg)	ND	ND	ND	ND	N/A	N/A
Thallium (mg/kg)	ND	ND	ND	ND	5.2	67
Vanadium (mg/kg)	57	14	11	32	550	7,200
Zinc (mg/kg)	61	26	44	45	23,000	100,000
Sample Date	01/11/08	01/11/08	01/11/08	01/11/08		

PRG – USEPA Region IX Preliminary Remediation Goal
Bold type – Analysis exceeds Residential PRG
N/A – Not Applicable (PRG values do not exist)
ND – Compound was not detected

5.7 Quality Control Measures

5.7.1 General Objectives

Field quality control samples were collected during sampling and analysis activities at the Horton site to ensure that the analytical results are representative of the media and conditions present. All data was calculated and reported in units consistent with those used by other organizations reporting similar data to allow comparability of data bases. Data is reported in micrograms per kilogram (μg/kg) and milligrams per kilogram (mg/kg) for soil samples.

There were five characteristics of major importance with respect to the assessment of generated data:

Accuracy

Accuracy is the degree of agreement of a measurement, or the average of several measurements with an accepted reference or "true" value; it is a measure of bias in the system.

Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter under the same conditions.

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represents the characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples, given that the components of these media are usually homogeneously dispersed. In contrast, soil and sediment contaminants are unlikely to be evenly distributed; hence, it is important for the sampler and analyst to exercise good judgment when collecting and analyzing a sample.

Comparability

Comparability expresses the confidence with which one set of data can be compared to another.

5.7.2 Field Quality Control Samples

A brief discussion of each field quality control sample type that was utilized is provided herein. KSG utilized, at a minimum, one of each of the following samples for quality control purposes for every ten soil samples collected (see Table 5-2).

Duplicate Samples

Duplicate samples provide insight as to the homogeneity of the sample matrix and enable consideration of variations in contaminant concentrations present in the matrix. Duplicate sample data confirm that the sample represents site conditions.

Duplicate soil samples were prepared by collecting a grab sample and splitting it into two separate bottle sets. Duplicate samples were shipped with the samples they represent and were analyzed in the same manner.

Trip Blanks

Trip blanks were collected to establish that transportation of sample bottles to and from the field did not result in the contamination of the sample from external sources. A trip blank was collected for, and in conjunction with, only VOC sampling tasks. The trip blank was treated in the same manner as the VOC samples they represent. The trip blanks for this project were sent with the sample shipping container that contained VOC samples.

Field Equipment Blanks

Field equipment blanks are blank samples (sometimes called rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use and that cleaning procedures between samples are sufficient to minimize cross-contamination. A field equipment blank was prepared by pouring analyte-free water over the sampling equipment. The field equipment blank was preserved, documented, shipped, and analyzed in the same manner as the sample it represents.

Table 5-2
Soil Sample Quality Control Frequency

Matrix	Analytical Parameter (Method Number)	Number of Field Samples	Field QC Samples			Total Samples
			Duplicate	Equipment Rinse	Trip Blank	
Subsurface Soil	VOCs (EPA Method 8260B)	11	1	1	1	14
	Semi-VOCs (EPA Method 8270C)	11	1	1	0	13
	Total Analyte List Metals	11	1	1	0	13

Section 6.0
Conclusions &
Recommendations

SECTION 6.0

CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

IBC removal activities were implemented by NES personnel from December 2006 through December 2007. During this time period, a total of 9,462 IBCs were processed and transported to the Union County Landfill for final disposal. Many of the IBCs contained varying quantities of liquids and/or solids. Liquids, including IBC decontamination rinse water, were stored in bulk containers until analytical testing could be performed. During the project, 1,282,179 gallons of liquid were disposed of as nonhazardous waste at the Vopak facility located in Mauldin, SC. Additionally, 725 tons of solids and sludge were transported to Vopak as nonhazardous waste for disposal. Additionally, 84,970 gallons of liquid required disposal as a hazardous waste during this project.

At the completion of IBC processing activities, eleven soil samples were collected from locations across the Piedmont site to check for evidence of contamination from IBC spillage or leakage. Data generated during the soil sampling and analysis program revealed no evidence of VOCs, semi-VOCs or TAL metals at concentrations exceeding the corresponding USEPA Region IX PRGs for industrial properties. However, several samples did contain one or more metals at concentrations exceeding the USEPA Region IX PRG for residential properties. It should be noted that the exceedences were primarily for iron.

6.2 Recommendations

Confirmation soil sample data revealed no evidence of contaminants at concentrations exceeding the corresponding USEPA Region IX PRGs for industrial properties. Therefore, in accordance with the Soil Sampling & Analysis Work Plan dated January 8, 2008, soil removal and disposal is not recommended at the Piedmont site.

Section 7.0
References

SECTION 7.0

REFERENCES

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APPENDICES

APPENDIX A – IBC DISPOSAL MANIFESTS

APPENDIX B – LIQUID WASTE DISPOSAL MANIFESTS

APPENDIX C – SLUDGE DISPOSAL MANIFESTS