

**SITE ASSESSMENT REPORT
FOR
POLYCHEM SERVICES SITE
CHICAGO HEIGHTS, COOK COUNTY, ILLINOIS**

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch
Region V
77 West Jackson Boulevard
Chicago, IL 60604-3507

Prepared by:

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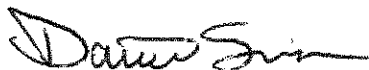
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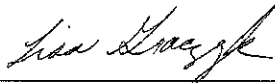
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Date: March 20, 2012

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LIST OF ABBREVIATIONS AND ACRONYMS

°F	Degree Fahrenheit
bgs	Below ground surface
CFR	<i>Code of Federal Regulations</i>
Chemtech	Chemtech Services, Inc.
Heartland Polymer	Heartland Polymer, Inc.
IEPA	Illinois Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OSC	On-Scene Coordinator
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
Polychem Services	Polychem Services, Inc.
PPE	Personal protective equipment
RCRA	Resource Conservation and Recovery Act
SIM	Selected ion monitoring
START	Superfund Technical Assessment and Response Team
SU	Standard unit
SVOC	Semivolatile organic compound
TACO	Tiered Approach to Corrective Action
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TDD	Technical Direction Document
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WESTON	Weston Solutions, Inc.
WWTP	Wastewater treatment plant

1. INTRODUCTION

The United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to assist the U.S. EPA in performing a site assessment at the Polychem Services Site (Site) in Chicago Heights, Cook County, Illinois (the Site; **Figure 1-1**). Specifically, under Technical Direction Document (TDD) No. S05-0001-1112-017, U.S. EPA requested that WESTON START document current Site conditions; collect waste liquid, waste solid, surface water, and soil samples; obtain photographic documentation; and evaluate the potential for imminent and substantial threats to the public health or welfare of the United States or the environment posed by Site-related conditions. On January 25, 26 and 27, 2012, WESTON START conducted the site assessment under the direction of the U.S. EPA On-Scene Coordinator (OSC), Mr. Ramon Mendoza.

This site assessment report is organized into the following sections:

- **Introduction** – Provides a brief description of the scope of site assessment activities
- **Site Background** – Details the Site description and its known history
- **Site Assessment Activities** – Discusses methods and procedures used during the site assessment
- **Analytical Results** – Discusses analytical results for samples collected during the site assessment
- **Threats to Human Health and the Environment** – Identifies Site conditions that may warrant a removal action under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
- **Conclusions** – Summarizes the site assessment conclusions

Figures and tables are presented after the conclusions section. In addition, this site assessment report contains two appendices. **Appendix A** provides photographic documentation of Site conditions and activities at the time of the site assessment, and **Appendix B** provides the laboratory analytical and data validation reports for samples collected during the site assessment.

2. SITE BACKGROUND

This section discusses the Site description and history.

2.1 SITE DESCRIPTION

The Site is located at 374 East Joe Orr Road in Chicago Heights, Cook County, Illinois, approximately 0.3 mile south of Joe Orr Road on an unnamed access road (**Figure 2-1**). The Site's geographical coordinates are 41° 30' 56.34" North latitude and 87° 37' 26.56" West longitude. The Site is bordered to the north by an Esmark Steel Group manufacturing facility; to the east by a railroad track and undeveloped land; to the south by a railroad track, undeveloped land, a vacant lot, and an industrial facility; and to the west by an unnamed access road, an Ace Hardware paint manufacturing facility, a railroad, and Joe Orr Woods (a Cook County forest preserve).

The closest residences are located approximately 0.36 mile southwest of the Site. The closest waterway is Thorn Creek approximately 0.35 mile west of the Site. The Thorn Creek Basin Sanitary District wastewater treatment plant (WWTP) is located approximately 0.18 mile northwest of the Site. A drainage ditch borders the Site to the west and runs north-south along the access road. The Site occupies approximately 4 acres and contains an approximately 25,000-square-foot chemical conversion facility (**Photograph No. 1** in **Appendix A**). **Figure 2-2** shows the Site features map. A chain-link fence surrounds the entire Site property. A drainage ditch is located on the west side of the Site property and runs north-south along the access road.

2.2 SITE HISTORY

Heartland Polymer, Inc. (Heartland Polymer), owned and operated the Site until May 2008, when Polychem Services, Inc. (Polychem Services), purchased the buildings and equipment (such as tanks, reactors, instrumentation, etc.) housed at the Site. Chemical processes conducted by Polychem Services have included condensation reactions, free radical polymerization, and Lewis acid alkylation reactions. Products produced by Polychem Services at the Site have included polyesters, alkyl resins, acrylic resins, and thermal-pressure addition resins. Polychem Services is working with Chemtech Services, Inc. (Chemtech), at the Site and as part of its daily operations currently reprocesses saturated amine scrubber solutions (amine sulfate solutions) into pure amines for reuse in the foundry industry.

The U.S. EPA inspected the Site in August 2010 and identified over 800 containers of hazardous

and non-hazardous waste materials in steel drums and plastic totes, many of which contained ignitable and corrosive liquids and solids. The U.S. EPA is investigating the Site for potential violations under the Resource Conservation and Recovery Act (RCRA).

Based on site assessment observations and analytical results that are described in this site assessment report, an emergency removal action was conducted by Polychem Services at the direction of the U.S. EPA from February 1 through 6, 2012. The emergency removal was initiated because of the presence of leaking and open containers at the facility and the confirmation from analytical results that indicated ignitable, corrosive, and toxic hazardous wastes were present in the leaking and open containers (see **Sections 3.0** and **4.0**). In addition, pollutants were observed migrating from the Site in surface water runoff to an off-site storm sewer. Polychem Services contractors performed the emergency removal which included overpacking 60 leaking and open drums, securing the lids on 17 drums, securing 8 open totes, , cleaning up a spill, and stopping off-site releases of hazardous substance, pollutants, and contaminants in the northwest corner of the Site. U.S. EPA and WESTON START performed oversight of these emergency removal activities. A Letter Report dated March 2, 2012, for the Polychem Services emergency removal provides further details.

3. SITE ASSESSMENT ACTIVITIES

This section discusses the site reconnaissance and observations and sampling activities during the site assessment.

3.1 SITE RECONNAISSANCE AND OBSERVATIONS

On January 25, 26, and 27, 2012, U.S. EPA and WESTON START conducted a site assessment to document Site conditions and evaluate the Site for a potential time-critical removal action. During the site assessment, U.S. EPA and WESTON START conducted air monitoring using a MicroR gamma radiation detector and a MultiRAE multi-gas air monitor to monitor air in the breathing zone for carbon monoxide, hydrogen sulfide, lower explosive limit, oxygen, and volatile organic compounds (VOC). All ambient air monitoring readings were at or below background levels. Polychem Services operators were observed working in the 25,000-square-foot chemical conversion facility at the time of the site assessment.

WESTON START divided the Site into five regions where containers were observed: the west, northwest, northeast, east, and southeast regions (**Figure 2-2**). All containers observed during the site assessment were staged outdoors. Chemtech's facility operator, Mr. Tom Riggins, reported that the west and northwest regions of the Site contained containers originally belonging to Heartland Polymer. The Heartland Polymer containers have been stored at the facility since Heartland Polymer ceased operations in 2008 and are not used in Polychem Services's current operations. Chemtech's facility operator, Mr. Tom Riggins, reported that the northeast, east, and southeast regions of the Site contained containers belonging to Polychem Services.

Northwest and West Regions

A total of 592 drums, 53 totes, and 26 cubic-yard containers were observed in the northwest and west regions of the Site. Of these containers, 207 were labeled "flammable," "corrosive," or "hazardous" and 313 were unlabeled. **Table 3-1** summarizes labeling observed on each of the 671 containers inventoried in the west and northwest regions of the Site during the site reconnaissance. In addition, 59 containers were observed to be leaking contents onto the ground and 46 were observed to be open. Surface water containing oily product and sheen was observed flowing from an area where the drums were staged in the northwest region of the Site to an adjacent off-site storm sewer. The issues of leaking containers and contaminated surface water runoff were addressed during the emergency removal action which occurred after this site assessment (see **Section 2.2**). Drums were on average 75 percent full, and totes and cubic-yard containers were on average 90 percent full. Based on these averages, approximately 43,022 gallons of waste liquids and solids are stored in the west and northwest regions of the Site (see table below).

	No. of 55-Gallon Drums	No. of 35-Gallon Drums	No. of 270-Gallon Totes	No. of 330-Gallon Totes	No. of Cubic-Yard Containers	Total Gallons of Waste
West and Northwest (containers belonging to Heartland Polymer)	590	2	34	19	26	-
Total Gallons of Liquid and Solid Wastes	24,338	53	8,262	5,643	4,727	43,022

Northeast, East, and Southeast Regions

Approximately 356 drums and 662 totes were observed staged outdoors in the northeast, east, and southeast regions of the Site. Seven containers were observed to be leaking contents onto the ground, and two were observed to be open. These leaking and open containers were overpacked or secured as necessary during the emergency removal action that occurred after this site assessment (see Section 2.2) or by Polychem Services prior to the emergency removal. A full inventory of these containers could not be performed due to a lack of aisle space between stacks of containers; however, approximately 75% of the containers observed were labeled "DMEA Sulfate Solution." Additional labels on the containers included "DMIPA Sulfate Solution," "Corrosive," "Liquid Isocyanate Resin," "Xylene," and "Spent Scrubber Solution." Furthermore, numerous totes and drums were in poor condition due to cracking, bulging, and solar damage (see All Photos, especially **Photograph No. 7** in **Appendix A**). Assuming drums were on average 75 percent full, and totes and cubic-yard containers were on average 90 percent full, approximately 175,551 gallons of waste liquids and solids are stored in the northeast, east, and southeast regions of the Site (see table below). Approximately 131,663 gallons of these wastes are DMEA sulfate solution.

	No. of 55-Gallon Drums	No. of 270-Gallon Totes	Total Gallons of Waste
Northeast, East, and Southeast (containers belonging to Polychem Services)	356	662	-
Total Gallons of Liquid and Solid Wastes	14,685	160,866	175,551

Based on these totals, 948 drums, 715 totes, and 26 cubic-yard containers and a total of approximately 218,573 gallons of waste liquids and solids are stored in all regions at the Site. WESTON START also observed animal footprints in mud next to open and leaking containers in the northeast region of the Site.

3.2 SAMPLING ACTIVITIES

On January 25 and 26, 2012, WESTON START sampled drums, totes, surface water, and soil at the Site. **Table 3-2** summarizes the waste liquid and waste solid samples collected from the Site,

and **Table 3-3** summarizes the surface water and soil samples collected from the Site. Eleven waste liquid samples including one duplicate sample, three waste solid samples, one surface water sample, and three soil samples including one duplicate were collected. **Figure 3-1** shows the sampling locations. Each sample is described below.

Waste liquid sample PS-WL03-012512 and PS-WL03D-012512 (duplicate) consisted of an orange liquid collected from a 55-gallon steel drum in the northwest region of the Site labeled "Flammable," "MEK," and "Methanol." Waste liquid sample PS-WL04-012512 consisted of an orange liquid collected from a 55-gallon steel drum in the west region of the Site labeled "Hazardous Waste" and "Flammable." Waste liquid sample PS-WL05-012512 consisted of a black liquid collected from a 270-gallon polyethylene tote in the northwest region of the Site labeled "Spent Scrubber Solution" and "Corrosive." Waste liquid sample PS-WL06-012512 consisted of a clear liquid collected from a 55-gallon steel drum in the east region of the Site labeled "Toluene" and "Flammable." Waste liquid sample PS-WL07-012612 consisted of a brown liquid collected from a 270-gallon polyethylene tote in the northwest region of the Site labeled "DMEA Sulfate Solution" and "Corrosive." Waste liquid sample PS-WL08-012612 consisted of a black liquid collected from an unlabeled, leaking 55-gallon steel drum in the northwest region of the Site. Waste liquid sample PS-WL09-012612 consisted of a black liquid collected from a cracked 270-gallon polyethylene tote in the west region of the Site labeled "DMEA Sulfate Solution" and "Corrosive." Waste liquid sample PS-WL11-012612 consisted of an orange liquid collected from a leaking 55-gallon steel drum in the west region of the Site labeled "Hazardous Waste" and "Flammable." Waste liquid sample PS-WL12-012612 consisted of an orange liquid collected from a leaking 55-gallon steel drum in the west region of the Site labeled "Flammable." Waste liquid sample PS-WL13-012612 consisted of an orange liquid collected from a leaking 55-gallon steel drum in the west region of the Site labeled "Hazardous Waste" and "Flammable."

Waste solid sample PS-WS01-012512 consisted of a brown solid collected from an unlabeled, leaking cubic-yard fiber container in the west region of the Site. Waste solid sample PS-WS02-012612 consisted of a white solid collected from an open, unlabeled 55-gallon steel drum in the southeast region of the Site. Waste solid sample PS-WS03-012612 consisted of a black viscous

resin collected from an open, leaking 330-gallon polyethylene tote in the southeast region of the Site.

Surface water sample PS-W01-012512 consisted of a composite sample of pooled water migrating from drums in the northwest region to the off-site storm sewer. Surface water from the east and west sides of the fenceline was composited.

Soil samples PS-S01-012612 and PS-S01D-012612 (duplicate) consisted of a composite sample from three locations separated by approximately 50 feet collected from 0 to 6 inches below ground surface (bgs) from the drainage ditch bordering the Site to the west. This drainage ditch collects surface runoff from the Site and flows north toward Joe Orr Road. Soil sample PS-S02-012612 was a background soil sample collected from 0 to 6 inches bgs from Joe Orr Woods, a Cook County Forest Preserve located approximately 0.35 mile northwest of the Site.

The sampling activities were conducted in Level B, Level C, and Level D personal protective equipment (PPE) in accordance with the approved site-specific health and safety plan. When applicable, pH paper or a MultiRAE photoionization detector was used to screen sampled liquids or solids. Fresh sampling gloves were donned before sampling activities began for each new sampling container as necessary. Waste liquid samples were collected using disposable polyethylene bailers or glass drum thieves, and waste solid samples were collected using disposable polyethylene scoops. Waste liquid and waste solid sample containers were filled directly from the bailers, drum thieves, and scoops and labeled with the sample identification numbers. Soil samples were collected using a hand trowel or a Terracore soil sampler. The surface water sample was collected by first shoveling pooled water into a 5-gallon bucket using a flat-head spade shovel. Water then was poured into the sample containers. All sampling information was recorded in the Site logbook and on chain-of-custody forms.

The 14 waste samples were submitted under chain-of-custody to ALS Laboratory Group of Holland, Michigan, for analysis for one or more of the following: flashpoint, pH, Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP semivolatile organic compounds (SVOC), Target Compound List (TCL) VOCs, TCL SVOCs, Target Analyte List (TAL) metals, and polychlorinated biphenyls (PCB). The surface water sample was analyzed for pH, TCL

VOCs, TCL SVOCs, polycyclic aromatic hydrocarbons (PAH), and TAL metals. Soil samples were analyzed for TCL VOCs, TCL SVOCs, and TAL metals. **Section 4** discusses the analytical results.

4. ANALYTICAL RESULTS

Analytical results for flashpoint (ignitability), pH (corrosivity), and TCLP VOCs and SVOCs were compared to the hazardous waste criteria outlined in Title 40 of the *Code of Federal Regulations* (40 CFR), Part 261, Subpart C, to determine if the samples represent materials considered hazardous waste. Surface water analytical results for TCL VOCs, TCL SVOCs, and TAL metals were used to determine if contaminants were present in surface water runoff. Soil sample analytical results for TCL VOCs, TCL SVOCs, and TAL metals were compared to Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action (TACO) Tier 1 Industrial/Commercial Ingestion and Inhalation Standards. **Tables 4-1** through **4-3** summarize detected results for the waste liquid and waste solid samples, the surface water sample, and the soil samples, respectively. **Appendix B** provides the laboratory analytical and data validation reports for the samples. Laboratory analytical results for the waste liquid and waste solid, surface water, and soil samples are summarized below.

4.1 WASTE LIQUID AND WASTE SOLID ANALYTICAL RESULTS

Flashpoint (Ignitability) - Table 4-1

- Waste liquid samples PS-WL06-012512, PS-WL11-012612, PS-WL12-012612, and PS-WL13-012612 had flashpoints of 65, 84, 108, and 120 degrees Fahrenheit (°F), respectively. According to 40 CFR 261.21, a liquid with a flashpoint below 140 °F exhibits the characteristic of ignitability. Therefore, these four samples represent liquids that meet the definition of hazardous waste for the characteristic of ignitability.

pH (Corrosivity) - Table 4-1

- Waste liquid sample PS-WL07-012612 and waste solid sample PS-WS02-012612 had pH values of 13.1 and 13.6 standard units (SU), respectively. According to 40 CFR 261.22, a pH value of greater than or equal to 12.5 SUs or less than or equal to 2 SUs exhibits the characteristic of corrosivity. Therefore, these two samples represent materials that meet the definition of hazardous waste for the characteristic of corrosivity.

TCLP VOCs (Toxicity) - Table 4-1

- Waste liquid sample PS-WL11-012612 contained TCLP 2-butanone and benzene at 800 and 700 milligrams per liter (mg/L), respectively. These concentrations exceed the 2-butanone and benzene TCLP regulatory limits of 200 and 0.5 mg/L, respectively. Therefore, according to 40 CFR 261.24, waste liquid sample PS-WL11-012612 represents a material that meets the definition of hazardous waste for the characteristic of toxicity.

TCLP SVOCs (Toxicity)

- No waste liquid or waste solid sample contained any TCLP SVOCs at concentrations exceeding their respective laboratory detection limits.

TCL VOCs - Table 4-1

- Waste liquid sample PS-WL03-012512 contained 2-butanone at 340 mg/L; ethylbenzene at 2,600 mg/L; isopropylbenzene at 48 mg/L; toluene at 110 mg/L; and total xylenes at 11,000 mg/L.
- Waste liquid sample PS-WL03D-012512 contained 2-butanone at 350 mg/L; ethylbenzene at 1,200 mg/L; isopropylbenzene at 52 mg/L; toluene at 120 mg/L, and total xylenes at 5,100 mg/L.
- Waste liquid sample PS-WL04-012512 contained ethylbenzene at 32,000 mg/L; isopropylbenzene at 1,200 mg/L; toluene at 3,600 mg/L; and total xylenes at 200,000 mg/L.
- Waste liquid sample PS-WL06-012512 contained toluene at 810,000 mg/L.
- Waste liquid sample PS-WL07-012612 contained ethylbenzene at 8.2 mg/L, isopropylbenzene at 0.86 mg/L, methyl acetate at 4.3 mg/L, toluene at 3.3 mg/L, and total xylenes at 55 mg/L.
- Waste liquid sample PS-WL08-012612 contained ethylbenzene at 94 mg/L, isopropylbenzene at 7.3 mg/L, styrene at 13 mg/L, toluene at 62 mg/L, and total xylenes at 330 mg/L.
- Waste liquid sample PS-WL11-012612 contained 4-methyl-2-pentanone at 1,400 mg/L; benzene at 300 mg/L; ethylbenzene at 36,000 mg/L; isopropylbenzene at 3,000 mg/L; toluene at 4,100 mg/L; and total xylenes at 160,000 mg/L.
- Waste liquid sample PS-WL12-012612 contained ethylbenzene at 12,000 mg/L; isopropylbenzene at 780 mg/L; toluene at 960 mg/L; and total xylenes at 54,000 mg/L.
- Waste liquid sample PS-WL13-012612 contained ethylbenzene at 3,500 mg/L; isopropylbenzene at 3,000 mg/L; and total xylenes at 14,000 mg/L.
- Waste solid sample PS-WS01-012512 contained benzene at 0.51 milligrams per kilogram (mg/kg), ethylbenzene at 100 mg/kg, isopropylbenzene at 7.3 mg/kg, styrene at 41 mg/kg, toluene at 2.1 mg/kg, and total xylenes at 420 mg/kg.
- Waste solid sample PS-WS02-012612 contained ethylbenzene at 0.41 mg/kg, methyl acetate at 0.29 mg/kg, and total xylenes at 1.9 mg/kg.

- Waste solid sample PS-WS03-012612 contained ethylbenzene at 450 mg/kg; isopropylbenzene at 28 mg/kg; toluene at 13 mg/kg; and total xylenes at 1,100 mg/kg.

TCL SVOCs – Table 4-1

- Waste liquid sample PS-WL07-012612 contained phenol at 93 mg/L.
- Waste liquid sample PS-WL08-012612 contained 1,1-biphenyl at 310 mg/L, acetophenone at 96 mg/L, anthracene at 700 mg/L, phenanthrene at 590 mg/L, phenol at 160 mg/L, and pyrene at 230 mg/L.
- Waste liquid sample PS-WL11-012612 contained phenol at 1,000 mg/L.
- Waste liquid sample PS-WL12-012612 contained acetophenone at 670 mg/L.
- Waste liquid sample PS-WL13-012612 contained acetophenone at 2,200 mg/L.
- Waste solid sample PS-WS01-012512 contained acetophenone at 860 mg/kg.

TAL Metals – Table 4-1

- Waste liquid sample PS-WL-08-012612 contained calcium and sodium at 69 and 24 mg/L, respectively.
- Waste solid sample PS-WS01-012512 contained aluminum, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, sodium, and zinc at concentrations ranging from 0.51 to 320 mg/kg.

PCBs

- PCBs were not detected in waste liquid sample PS-WL08-012612, the only sample analyzed for PCBs.

4.2 SURFACE WATER ANALYTICAL RESULTS

TCL VOCs – Table 4-2

- Surface water sample PS-W01-012512 contained ethylbenzene at 0.013 mg/L, isopropylbenzene at 0.00105 mg/L, toluene at 0.0012 mg/L, and total xylenes at 0.07 mg/L.

TCL SVOCs – Table 4-2

- Surface water sample PS-W01-012512 contained 2-methylnaphthalene at 0.0006 mg/L, acetophenone at 0.0062 mg/L, anthracene at as high as 0.008 mg/L, naphthalene at 0.00034 mg/L, phenanthrene at as high as 0.0096 mg/L, and phenol at 0.036 mg/L. PAHs were analyzed under the standard SVOC methodology and using a modified selected ion monitoring (SIM) methodology to achieve lower detection limits. Therefore, **Table 4-2** lists some of these compounds twice.

TAL Metals – Table 4-2

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- Surface water sample PS-W01-012512 contained 19 metals at concentrations ranging from 0.00024 to 1,800 mg/L.

4.3 SOIL ANALYTICAL RESULTS

TCL VOCs – Table 4-3

- Soil sample PS-S01-012612 contained 2-butanone and acetone at 0.02 and 0.068 mg/kg, respectively. These concentrations are below the available IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation. Note that Tier 1 standards are not available for 2-butanone.
- Soil sample PS-S01D-012612 contained acetone at 0.047 mg/kg. This concentration is below the IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation.
- Background soil sample PS-S02-012612 contained acetone at 0.13 mg/kg. This concentration is below the IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation.

TCL SVOCs – Table 4-3

- Soil sample PS-S01-012612 contained benzo(a)pyrene at 0.95 mg/kg. This concentration exceeds the IEPA TACO Industrial Standard for ingestion of 0.8 mg/kg. Soil sample PS-S01-012612 also contained benzo(a)anthracene at 0.74 mg/kg, benzo(b)fluoranthene at 1.9 mg/kg, benzo(k)fluoranthene at 0.6 mg/kg, chrysene at 1.1 mg/kg, fluoranthene at 1.8 mg/kg, phenanthrene at 0.66 mg/kg, and pyrene at 1.3 mg/kg. These concentrations are below the IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation.
- Soil sample PS-S01D-012612 contained benzo(a)anthracene at 0.62 mg/kg, benzo(a)pyrene at 0.76 mg/kg, benzo(b)fluoranthene at 1.6 mg/kg, benzo(k)fluoranthene at 0.5 mg/kg, chrysene at 0.99 mg/kg, fluoranthene at 1.8 mg/kg, phenanthrene at 0.7 mg/kg, and pyrene at 1.3 mg/kg. These concentrations are below the IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation.
- Background soil sample PS-S02-012612 contained benzo(b)fluoranthene and pyrene at 0.053 and 0.058 mg/kg, respectively. These concentrations are below the IEPA TACO Tier 1 Industrial Standards for ingestion and inhalation.

TAL Metals – Table 4-3

- No soil sample contained TAL metal concentrations exceeding the IEPA TACO Tier 1 Industrial Standards for ingestion or inhalation.

5. THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

As mentioned in Section 2.2, an emergency removal action was conducted by Polychem Services at the direction of the U.S. EPA from February 1-6, 2012. The emergency removal was initiated

because of the presence of leaking and open containers at the facility and the confirmation from analytical results that indicated ignitable, corrosive, and toxic hazardous wastes were present in the leaking and open containers (see **Sections 3.0 and 4.0**). In addition, pollutants were observed migrating from the Site in surface water runoff to an off-site storm sewer. On February 1 through 6, 2012, Polychem Services performed the emergency removal which included overpacking 60 leaking and open drums, securing the lids on 17 drums, securing 8 open totes, cleaning up a spill, and stopping off-site releases of hazardous substances, contaminants, and pollutants in the northwest corner of the Site. The action temporarily stopped the off-site release of hazardous substances, or pollutants or contaminants. However the threat of release, migration, exposure, fire and explosion of hazardous substances, pollutants or contamination, remains and are described in the section.

Factors to be considered when determining the appropriateness of a potential removal action at a site are delineated in the NCP at 40 CFR 300.415(b)(2). The factors applicable to the Site are summarized below.

- **Actual or potential exposure of nearby human populations, animals, or the food chain to hazardous substances or pollutants or contaminants**

Analytical results for samples collected during the site assessment indicate that ignitable, corrosive, and toxic hazardous wastes are present in containers at the Site. Waste liquid samples PS-WL06-012512, PS-WL11-012612, PS-WL12-012612, and PS-WL13-012612 had flashpoints of 65, 84, 108, and 120 °F, respectively, indicating that the waste liquids associated with these samples are hazardous for the characteristic of ignitability. Waste liquid sample PS-WL07-012612 and waste solid sample PS-WS02-012612 had pH values of 13.1 and 13.6 SUs, respectively, indicating that the wastes associated with these samples are hazardous for the characteristic of corrosivity. Waste liquid sample PS-WL11-012612 contained TCLP 2-butanone and benzene at 800 and 700 mg/L, respectively, indicating the waste liquid in this drum is hazardous for the characteristic of toxicity. Continued deterioration of containers of hazardous wastes could result in releases of hazardous materials, contact with hazardous materials, fire, and reactions generating toxic gases. The closest residences are located approximately 0.36 mile southwest of the Site. The proximity of the Site to nearby commercial and residential areas greatly increases the potential for imminent and substantial threats to the public health or welfare of the United States or the environment if a release of hazardous materials occurs.

- **Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release**

During the site assessment, WESTON START observed 948 drums, 715 totes, and 26 cubic-yard containers staged outdoors at the Site. Four waste liquid samples collected from drums at the Site had flashpoints below 140 °F, meeting the definition of hazardous waste for the characteristic of ignitability. One of these samples also contained TCLP 2-butanone and benzene at 800 and 700 mg/L, respectively, meeting the definition of hazardous waste for the characteristic of toxicity. One waste liquid sample and one waste solid sample had pH values of 13.1 and 13.6 SUs, respectively, meeting the definition of hazardous waste for the characteristic of corrosivity. Numerous drums and totes were labeled "DMEA Sulfate Solution," "DMIPA Sulfate Solution," "Corrosive," "Flammable," "Liquid Isocyanate Resin," "Toluene," "Xylene," and "Spent Scrubber Solution." Furthermore, some totes and drums were in poor condition due to cracking, bulging, and solar damage. Continued deterioration of containers could result in releases of hazardous materials, contact with hazardous materials, fire, or reactions generating toxic gases.

- **High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate**

Analytical results for soil samples collected during the site assessment from the drainage ditch bordering the Site to the west indicate the presence of benzo(a)pyrene at a concentration of 0.95 mg/kg, which exceeds the IEPA TACO industrial standard for ingestion of 0.8 mg/kg. Contaminants detected in soil samples from the Site but not in the background soil sample included 2-butanone, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and antimony. The drainage ditch from which these soil samples were collected directs surface water runoff from the Site toward Joe Orr Road to the north.

- **Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released**

Chicago Heights receives a substantial amount of precipitation, and temperatures are normally below freezing during the winter, with regular snowfall. On average, Chicago Heights receives 39.22 inches of rainfall annually and temperatures range from 16 to 35 °F in the winter and from 60 to 84 °F in the summer. All containers observed during the site assessment were staged outdoors. Numerous non-leaking drums showed signs of rusting, and numerous non-leaking totes showed signs of solar damage, cracking, and bulging. Weather conditions causing freezing and thawing along with precipitation could increase the risk of currently intact containers developing leaks and therefore increase the risk of additional migration of hazardous substances or pollutants from the Site.

- **Threat of fire or explosion**

Waste liquid samples PS-WL06-012512, PS-WL11-012612, PS-WL12-012612, and PS-WL13-012612 had flashpoints of 65, 84, 108, and 120 °F, respectively, indicating that

the waste liquids associated with these samples are hazardous for the characteristic of ignitability. Over 141 containers in the west and northwest regions of the Site were labeled "Flammable." Therefore, the potential for a fire or explosion exists. If such an event occurs, contaminants could become airborne and may affect the nearby population.

6. CONCLUSIONS

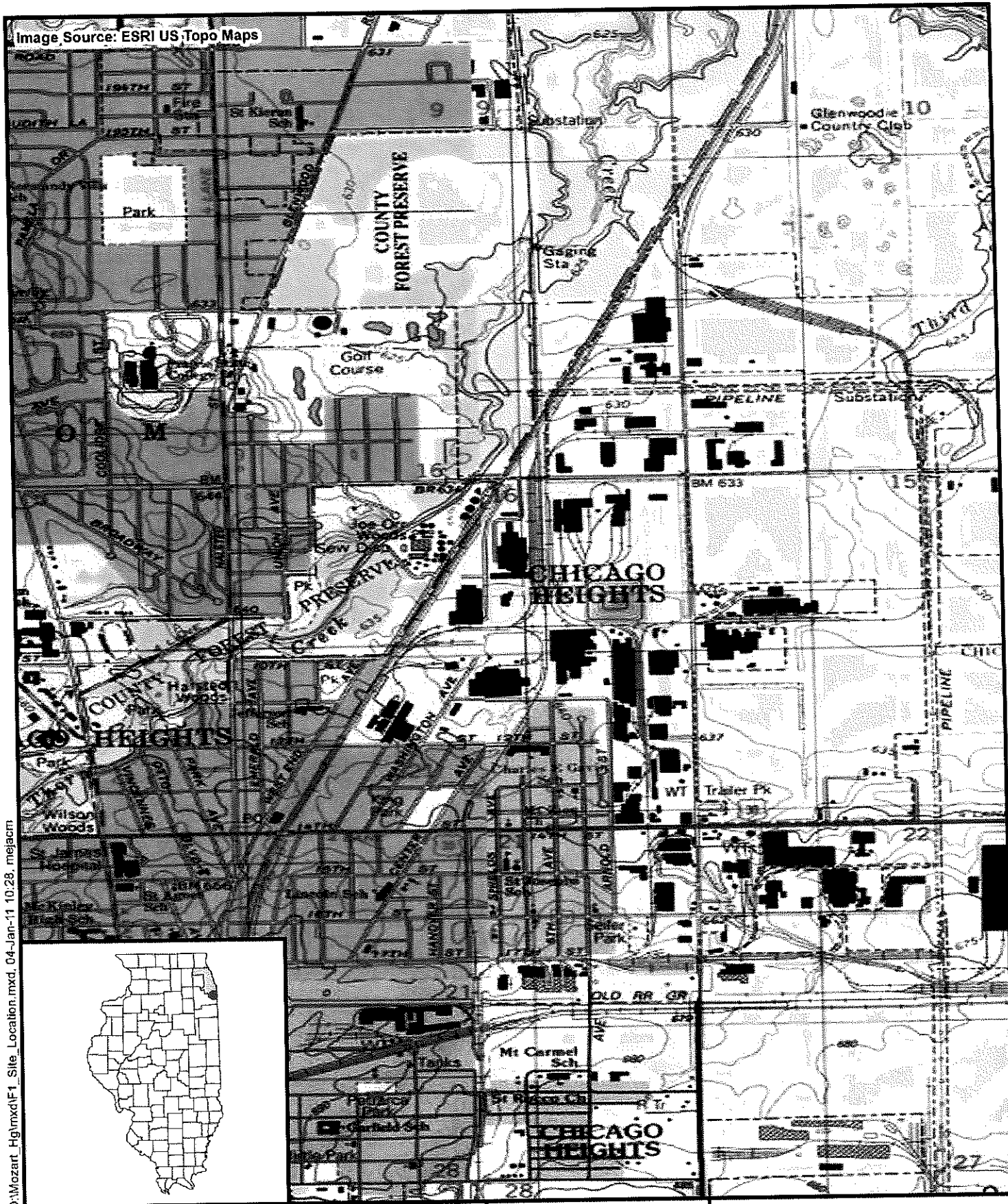
The site assessment consisted of a site reconnaissance followed by a field sampling event conducted on January 25, 26, and 27, 2012. During the site assessment, WESTON START observed a total of approximately 592 drums, 53 totes, and 26 cubic-yard containers in the west and northwest regions of the Site. Of these containers, 207 were labeled flammable, corrosive, or hazardous and 313 were unlabeled. A total of approximately 356 drums and 662 totes were observed in the northeast, east, and southeast regions of the Site. Numerous drums and totes were labeled "DMEA Sulfate Solution," "DMIPA Sulfate Solution," "Corrosive," "Flammable," "Liquid Isocyanate Resin," "Toluene," "Xylene," and "Spent Scrubber Solution." Furthermore, several totes and drums were in poor condition due to cracking, bulging, and solar damage. In total, approximately 218,573 gallons of waste liquids and solids are present at the Site.

WESTON START sampled drums, totes, surface water, and soil at and adjacent to the Site. Eleven waste liquid samples, three waste solid samples, one surface water sample, and three soil samples were collected. Analytical results for waste liquid and waste solid samples indicate the presence of ignitable, corrosive, and toxic hazardous wastes in containers at the Site. Analytical results for the surface water sample indicate the presence of VOCs and SVOCs in surface runoff from the Site. Analytical results for soil samples collected during the site assessment from the drainage ditch bordering the Site to the west indicate the presence of benzo(a)pyrene at a concentration exceeding the IEPA TACO Industrial Standard for ingestion.

In addition, after the site assessment activities, on February 1 through 6, 2012, Polychem Services, at the direction of the U.S. EPA, performed an emergency removal to overpack leaking and open drums and to clean up the spill in the northwest corner of the Site. U.S. EPA and WESTON START performed oversight of these emergency removal activities. The Letter Report dated March 2, 2012, for the Polychem Services emergency removal provides further details. The emergency removal action temporarily stopped the off-site release of hazardous

substances, or pollutants or contaminants. However the threat of release, migration, exposure, fire and explosion of hazardous substances, pollutants or contamination, remains.

FIGURES



File: D:\Mozart_Hg\mxd\F1_Site_Location.mxd, 04-Jan-11 10:28, mejacm

Legend

Site Boundary



Prepared for:
U.S. EPA REGION V

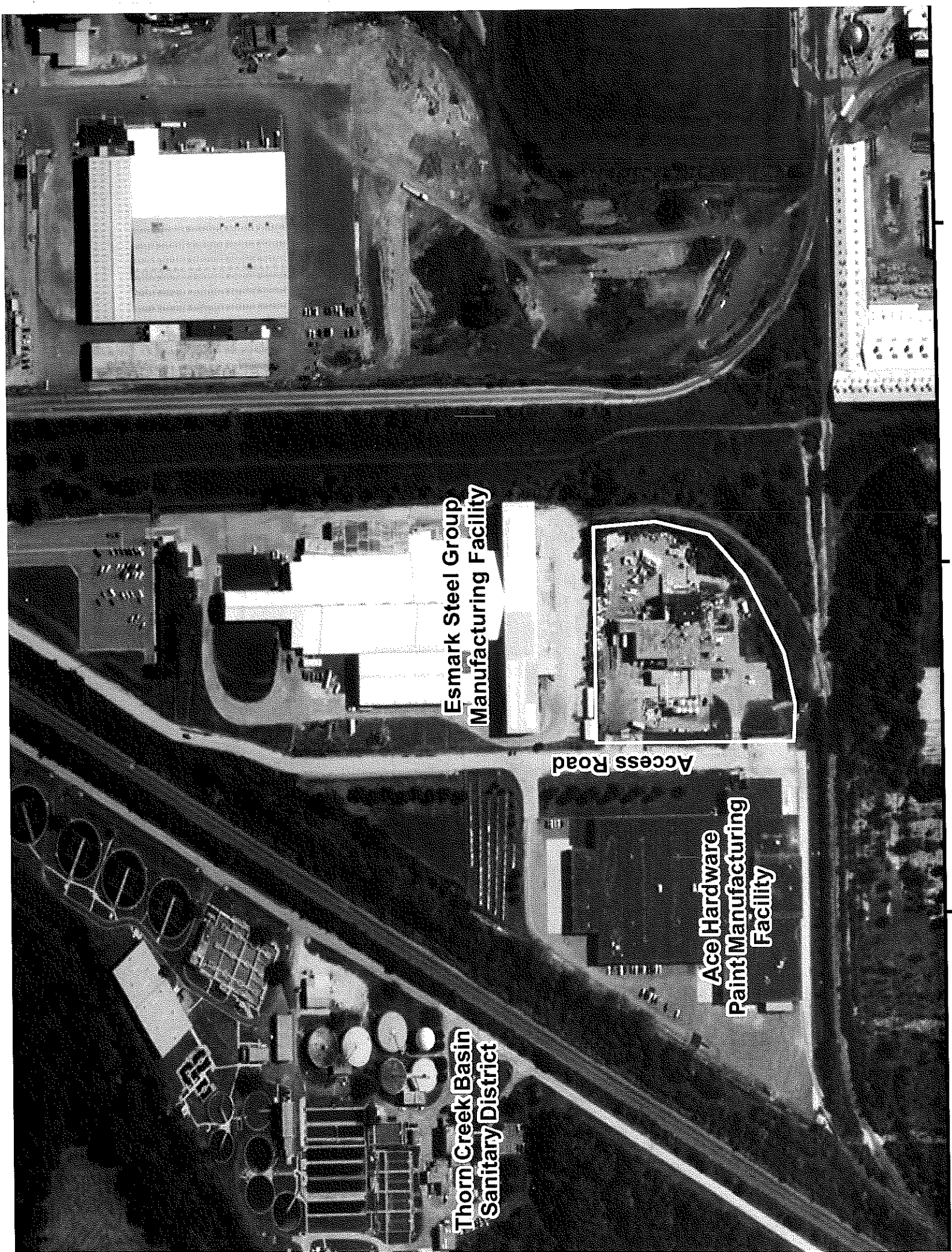
Contract No.: EP-S5-06-04
TDD: S05-0001-1112-017
DCN: 1711-2A-AUHL



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Figure 1-1
Site Location Map
Polychem Services Site
Chicago Heights, Cook County, Illinois



Esmark Steel Group
Manufacturing Facility

Access Road

Ace Hardware
Paint Manufacturing
Facility

Thorn Creek Basin
Sanitary District

Access Road

Northeast
Region

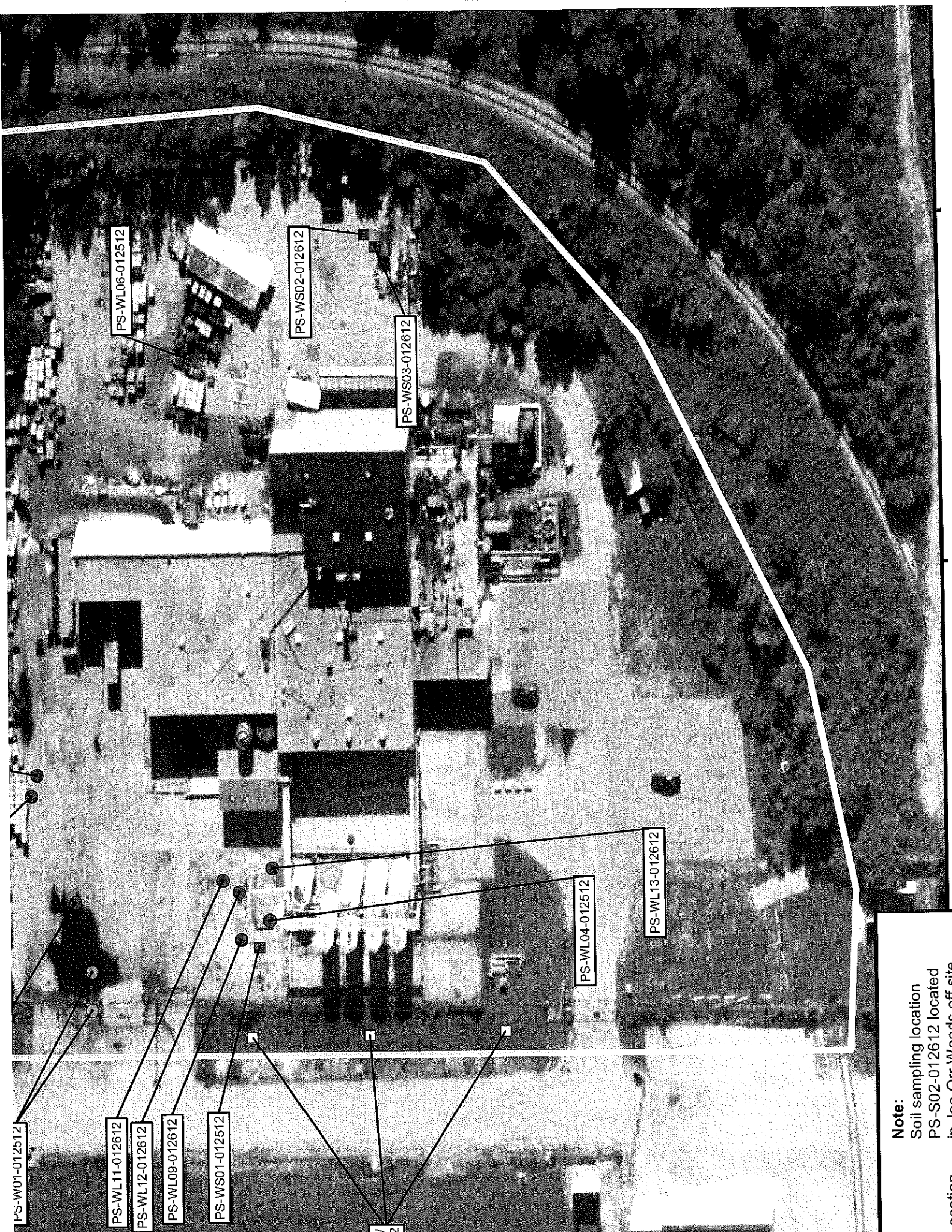
East
Region

Southeast
Region

Northwest
Region

West
Region

nt
lity



Note:
Soil sampling location
PS-S02-012612 located
in line Orr Woods off site

Location

TABLES

Table 3-1
West and Northwest Region Container Label Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

	Labeled "Hazardous"	Labeled "Flammable"	Labeled "Flammable" and "Hazardous"	Labeled "Corrosive"	Labeled "Non-Hazardous"	Labeled "Non-Regulated Waste"	Labeled "Non- Hazardous Epoxy Resin"	Other	Unlabeled / Unknown
West Region	8	38	76	3	4	0	3	13	39
Northwest Region	30	25	2	25	9	6	89	27	274
Total	38	63	78	28	13	6	92	40	313

Table 3-2
Waste Sampling Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Field Sample ID No.	Sampling Date	Sample Matrix	Sample Type	Container Type	Container Condition	Container Labeling	Container Region Location	U.S. EPA CID Drum ID	Heartland Polymer Drum ID	Analytical Parameter(s)
PS-WL03-012512	1/25/12	Waste Liquid	Grab	55-gallon steel drum	Fair	"Flammable," "MEK," and "Methanol"	Northwest	A480	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL03D-012512	1/25/12	Waste Liquid	Grab	55-gallon steel drum	Fair	"Flammable," "MEK," and "Methanol"	Northwest	A480	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL04-012512	1/25/12	Waste Liquid	Grab	55-gallon steel drum	Fair	"Hazardous Waste" and "Flammable"	West	C014	737	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL05-012512	1/25/12	Waste Liquid	Grab	270-gallon tote	Fair	"Spent Scrubber Solution" and "Corrosive"	Northwest	AT23	None	pH
PS-WL06-012512	1/25/12	Waste Liquid	Grab	55-gallon steel drum	Fair	"Toluene" and "Flammable"	East	B091	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL07-012612	1/26/12	Waste Liquid	Grab	270-gallon tote	Fair	"DMEA Sulfate Solution" and "Corrosive"	Northwest	AT10	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL08-012612	1/26/12	Waste Liquid	Grab	55-gallon steel drum	Poor - leaking	None	Northwest	None	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs, TAL Metals, PCBs
PS-WL09-012612	1/26/12	Waste Liquid	Grab	270-gallon tote	Poor - cracks along edges and top	"DMEA Sulfate Solution" and "Corrosive"	West	AT97	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL11-012612	1/26/12	Waste Liquid	Grab	55-gallon steel drum	Poor - Leaking	"Hazardous Waste" and "Flammable"	West	C007	751	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL12-012612	1/26/12	Waste Liquid	Grab	55-gallon steel drum	Poor - Leaking	"Flammable"	West	A040	677	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WL13-012612	1/26/12	Waste Liquid	Grab	55-gallon steel drum	Poor - Leaking	"Hazardous Waste" and "Flammable"	West	A086	164	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WS01-012512	1/25/12	Waste Solid	Grab	Cubic-yard fiber tote	Poor - open and leaking	None	West	None	None	pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs, TAL Metals
PS-WS02-012612	1/26/12	Waste Solid	Grab	55-gallon steel drum	Poor - open	None	Southeast	None	None	Flashpoint, pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs
PS-WS03-012612	1/26/12	Waste Solid	Grab	330-gallon tote	Poor - open and leaking	None	Southeast	None	None	pH, TCLP VOCs, TCLP SVOCs, TCL VOCs, TCL SVOCs

Notes:

CID = Criminal Investigation Division
DMEA = Dimethyl ethyl amine
Heartland Polymer = Heartland Polymer, Inc.
ID = Identification
MEK = Methyl ethyl ketone
No. = Number
PCB = Polychlorinated
SVOC = Semivolatile organic compound
TAL = Target Analyte List
TCL = Target Compound List
TCLP = Toxicity Characteristic Leaching Procedure
U.S. EPA = United States Environmental Protection Agency
VOC = Volatile organic compound

Table 3-3
Surface Water and Soil Sampling Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Field Sample ID No.	Date	Sample Matrix	Sample Type	Sampling Location	Analyses
PS-W01-012512	1/25/12	Surface water	Composite	Pooled water emanating from drums in northwest region to off-site storm sewer	pH, TCL VOCs, TCL SVOCs, PAHs, TAL Metals
PS-S01-012612	1/26/12	Soil	Composite	Drainage ditch bordering Site to the west	TCL VOCs, TCL SVOCs, TAL Metals
PS-S01D-012612	1/26/12	Soil	Composite	Drainage ditch bordering Site to the west	TCL VOCs, TCL SVOCs, TAL Metals
PS-S02-012612	1/26/12	Soil	Grab	Joe Orr Woods, a Cook County Forest Preserve	TCL VOCs, TCL SVOCs, TAL Metals

Notes:

ID = Identification

PAH = Polycyclic aromatic hydrocarbon

SVOC = Semivolatile organic compound

TAL = Target Analyte List

TCL = Target Compound List

VOC = Volatile organic compound

Table 4-1
Waste Liquid and Waste Solid Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID		1201631-02		1201631-04		1201631-06		1201631-01		1201631-10		1201631-17	
	Matrix		Waste Liquid		Waste Liquid		Waste Liquid		Waste Liquid		Waste Liquid		Waste Liquid	
	Location ID		WL-03		WL-03		WL-04		WL-05		WL-06		WL-07	
	Sampling Date		1/25/2012		1/25/2012		1/25/2012		1/25/2012		1/25/2012		1/26/2012	
	Field Sample ID		PS-WL03-012512		PS-WL03D-012512		PS-WL04-012512		PS-WL05-012512		PS-WL06-012512		PS-WL07-012612	
Regulatory Limit			Result											
Flashpoint (°F)	< 140		> 140		> 140		> 140		NA		65		> 140	
pH (SU)	≤ 2 or ≥ 12.5		7		5.37		7		5		7		13.1	
TCLP VOCs (mg/L)														
2-Butanone	200		19		19		5 U		NA		10,000 U		0.2 U	
Benzene	0.5		1 U		0.05 U		0.5 U		NA		1,000 U		0.02 U	
TCL VOCs (mg/L or mg/kg)														
2-Butanone	NA		340		350		2,500 U		NA		5,000 U		2.5 U	
4-Methyl-2-pentanone	NA		10 U		10 U		2,500 U		NA		5,000 U		2.5 U	
Benzene	NA		10 U		10 U		500 U		NA		1,000 U		0.5 U	
Ethylbenzene	NA		2,600		1,200		32,000		NA		400 U		8.2	
Isopropylbenzene	NA		48		52		1,200		NA		1,000 U		0.86	
Methyl acetate	NA		50 U		50 U		2,500 U		NA		5,000 U		4.3	
Styrene	NA		10 U		10 U		500 U		NA		1,000 U		0.5 U	
Toluene	NA		110		120		3,600		NA		810,000		3.3	
Xylenes, total	NA		11,000		5,100		200,000		NA		1,200 U		55	
TCL SVOCs (mg/L or mg/kg)														
1,1-Biphenyl	NA		0.5 U		0.49 U		0.44 U		NA		0.041 U		0.046 U	
Acetophenone	NA		0.1 U		0.099 U		0.088 U		NA		0.0082 U		0.0092 U	
Anthracene	NA		0.5 U		0.49 U		0.44 U		NA		0.041 U		0.046 U	
Phenanthrene	NA		0.5 U		0.49 U		0.44 U		NA		0.041 U		0.046 U	
Phenol	NA		0.5 U		0.49 U		0.44 U		NA		0.041 U		93	
Pyrene	NA		0.5 U		0.49 U		0.44 U		NA		0.041 U		0.046 U	
TAL Metals (mg/L or mg/kg)														
Aluminum	NA		NA		NA		NA		NA		NA		NA	
Barium	NA		NA		NA		NA		NA		NA		NA	
Calcium	NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA	
Copper	NA		NA		NA		NA		NA		NA		NA	
Iron	NA		NA		NA		NA		NA		NA		NA	
Lead	NA		NA		NA		NA		NA		NA		NA	
Magnesium	NA		NA		NA		NA		NA		NA		NA	
Manganese	NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA	
Sodium	NA		NA		NA		NA		NA		NA		NA	
Zinc	NA		NA		NA		NA		NA		NA		NA	

Table 4-1
Waste Liquid and Waste Solid Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID		1201628-04	1201631-20	1201628-08	1201628-06	1201628-10	1201631-08
	Matrix	Waste Liquid	Waste Liquid	Waste Liquid	Waste Liquid	Waste Liquid	Waste Liquid	Waste Solid
	Location ID	WL-08	WL-09	WL-11	WL-12	WL-13	WS-01	
	Sampling Date	1/26/2012	1/26/2012	1/26/2012	1/26/2012	1/26/2012	1/25/2012	
	Field Sample ID	PS-WL08-012612	PS-WL09-012612	PS-WL11-012612	PS-WL12-012612	PS-WL13-012612	PS-WS01-012512	
Result								
Regulatory Limit	< 140		> 140	84	108	120	NA	
Flashpoint (°F)	≤ 2 or ≥ 12.5		6.45	9.5	7	6.4	6	7.5
pH (SU)								
TCLP VOCs (mg/L)								
2-Butanone	200	1,000 U	0.2 U	800	5,000 U	5,000 U	5,000 U	0.2 U
Benzene	0.5	100 U	0.02 U	700	500 U	500 U	500 U	0.02 U
TCL VOCs (mg/L or mg/kg)								
2-Butanone	NA	25 U	25 U	500 U	250 U	10,000 U	10,000 U	5.1 U
4-Methyl-2-pentanone	NA	25 U	25 U	1,400	250 U	10,000 U	10,000 U	5.1 U
Benzene	NA	5 U	5 U	300	50 U	2,000 U	2,000 U	0.51
Ethylbenzene	NA	94	5 U	36,000	12,000	3,500	3,500	100
Isopropylbenzene	NA	7.3	5 U	3,000	780	3,000	3,000	7.3
Methyl acetate	NA	25 U	25 U	500 U	250 U	10,000 U	10,000 U	5.1 U
Styrene	NA	13	5 U	100 U	50 U	2,000 U	2,000 U	41
Toluene	NA	62	5 U	4,100	960	2,000 U	2,000 U	2.1
Xylenes, total	NA	330	15 U	160,000	54,000	14,000	14,000	420
TCL SVOCs (mg/L or mg/kg)								
1,1-Biphenyl	NA	310	0.043 U	0.043 U	0.5 U	0.49 U	0.49 U	34 U
Acetophenone	NA	96	0.0086 U	0.0086 U	670	2,200	2,200	860
Anthracene	NA	700	0.043 U	0.043 U	0.5 U	0.49 U	0.49 U	3.1 U
Phenanthrene	NA	590	0.043 U	0.043 U	0.5 U	0.49 U	0.49 U	3.1 U
Phenol	NA	160	0.043 U	1,000	0.5 U	0.49 U	0.49 U	16 U
Pyrene	NA	230	0.043 U	0.043 U	0.5 U	0.49 U	0.49 U	3.1 U
TAL Metals (mg/L or mg/kg)								
Aluminum	NA	0.5 U	NA	NA	NA	NA	NA	43
Barium	NA	0.25 U	NA	NA	NA	NA	NA	1.8
Calcium	NA	69	NA	NA	NA	NA	NA	280
Chromium	NA	0.25 U	NA	NA	NA	NA	NA	0.92
Copper	NA	0.25 U	NA	NA	NA	NA	NA	2.5
Iron	NA	4 U	NA	NA	NA	NA	NA	320
Lead	NA	0.25 U	NA	NA	NA	NA	NA	0.82
Magnesium	NA	10 U	NA	NA	NA	NA	NA	81
Manganese	NA	0.25 U	NA	NA	NA	NA	NA	3.6
Nickel	NA	0.25 U	NA	NA	NA	NA	NA	0.51
Sodium	NA	24	NA	NA	NA	NA	NA	49
Zinc	NA	0.5 U	NA	NA	NA	NA	NA	9

Table 4-1
Waste Liquid and Waste Solid Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID		1201631-12		1201628-01	
	Matrix	Waste Solid	WS-02	WS-03		
	Location ID	WS-02	WS-03			
	Sampling Date	1/26/2012	1/26/2012			
	Field Sample ID	PS-WS02-012612	PS-WS03-012612			
Regulatory Limit	Result					
Flashpoint (°F)	< 140	> 140		NA		
pH (SU)	≤ 2 or ≥ 12.5	13.6		6		
TCLP VOCs (mg/L)						
2-Butanone	200	0.2 U		0.2 U		
Benzene	0.5	0.02 U		0.02 U		
TCL VOCs (mg/L or mg/kg)						
2-Butanone	NA	0.25 U		25 U		
4-Methyl-2-pentanone	NA	0.25 U		25 U		
Benzene	NA	0.05 U		5 U		
Ethylbenzene	NA	0.41		450		
Isopropylbenzene	NA	0.05 U		28		
Methyl acetate	NA	0.29		25 U		
Styrene	NA	0.05 U		5 U		
Toluene	NA	0.05 U		13		
Xylenes, total	NA	1.9		1,100		
TCL SVOCs (mg/L or mg/kg)						
1,1-Biphenyl	NA	3.1 U		0.44 U		
Acetophenone	NA	3.1 U		0.089 U		
Anthracene	NA	0.28 U		0.44 U		
Phenanthrene	NA	0.28 U		0.44 U		
Phenol	NA	1.5 U		0.44 U		
Pyrene	NA	0.28 U		0.44 U		
TAL Metals (mg/L or mg/kg)						
Aluminum	NA	NA		NA		
Barium	NA	NA		NA		
Calcium	NA	NA		NA		
Chromium	NA	NA		NA		
Copper	NA	NA		NA		
Iron	NA	NA		NA		
Lead	NA	NA		NA		
Magnesium	NA	NA		NA		
Manganese	NA	NA		NA		
Nickel	NA	NA		NA		
Sodium	NA	NA		NA		
Zinc	NA	NA		NA		

Notes:

Shaded and bolded results exceed the hazardous waste regulatory limits in Title 40 of the Code of Federal Regulations, Part 261, Subpart C.

> = Greater than

≤ = Less than or equal to

≥ = Greater than or equal to

°F - Degree Fahrenheit

ID = Identification

mg/L = Milligram per liter

mg/kg = Milligram per kilogram

NA = Not analyzed or not applicable

mg/kg = milligrams per kilo; U = Non-detect

SVOC = Semi-volatile organic compound

TCL = Target Compound List

TCLP = Toxicity Characteristic Leaching Procedure

U = Not detected at listed reporting limit

VOC = Volatile organic compound

1 Only detected parameters listed

Table 4-2
Surface Water Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID	1201628-03
	Matrix	Surface Water
	Location ID	W-01
	Sampling Date	1/25/2012
	Field Sample ID	PS-W01-012512
	Unit	Result
pH	SU	7.32
TCL VOCs		
Ethylbenzene	mg/L	0.013
Isopropylbenzene	mg/L	0.0015
Toluene	mg/L	0.0012
Xylenes, total	mg/L	0.07
TCL SVOCs		
Acetophenone	mg/L	0.0062
Anthracene	mg/L	0.0068
Phenanthrene	mg/L	0.0096
Phenol	mg/L	0.036
PAHs		
2-Methylnaphthalene	mg/L	0.0006
Anthracene	mg/L	0.008
Naphthalene	mg/L	0.00034
Phenanthrene	mg/L	0.0078
TAL Metals		
Aluminum	mg/L	18
Antimony	mg/L	0.0064
Arsenic	mg/L	0.013
Barium	mg/L	0.35
Cadmium	mg/L	0.0037
Calcium	mg/L	140
Chromium	mg/L	0.19
Cobalt	mg/L	0.0095
Copper	mg/L	0.14
Iron	mg/L	38
Lead	mg/L	0.17
Magnesium	mg/L	57
Manganese	mg/L	0.5
Nickel	mg/L	0.041
Potassium	mg/L	16
Sodium	mg/L	1,800
Vanadium	mg/L	0.053
Zinc	mg/L	2.5
Mercury	mg/L	0.00024

Notes:

ID = Identification

mg/L = Milligram per liter

PAH = Polycyclic aromatic hydrocarbon

SVOC = Semivolatile organic compound

¹ Only detected parameters listed

SU = Standard unit

TAL = Target Analyte List

TCL = Target Compound List

VOC = Volatile organic compound

Table 4-3
Soil Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID				1201631-14	1201631-15	1201631-16
	Matrix			Soil	Soil	Soil	
	Location ID			S-01	S-01	S-02	
	Sampling Date			1/26/2012	1/26/2012	1/26/2012	
	Field Sample ID			PS-S01-012612	PS-S01D-012612	PS-S02-012612	
	Regulatory Limit	Unit			Result		
TACO I/C-Ing	TACO I/C-Inh						
TCL VOCs							
2-Butanone	NA	NA	mg/kg	0.02 J	0.016 U	0.017 U	
Acetone	NA	100,000	mg/kg	0.068 J	0.047	0.13	
TCL SVOCs							
Benzo(a)anthracene	8	NA	mg/kg	0.74	0.62	0.052 U	
Benzo(a)pyrene	0.8	NA	mg/kg	0.95	0.76	0.052 U	
Benzo(b)fluoranthene	8	NA	mg/kg	1.9	1.6	0.053	
Benzo(k)fluoranthene	78	NA	mg/kg	0.6	0.5	0.052 U	
Chrysene	780	NA	mg/kg	1.1	0.99	0.052 U	
Fluoranthene	82,000	NA	mg/kg	1.8	1.8	0.052 U	
Phenanthrene	NA	NA	mg/kg	0.66	0.7	0.052 U	
Pyrene	61,000	NA	mg/kg	1.3	1.3	0.058	
TAL Metals							
Aluminum	NA	NA	mg/kg	9,100	8,000	9,500	
Antimony	820	NA	mg/kg	2.3	1.3	0.68 U	
Arsenic	NA	1,200	mg/kg	7.2	9	7.6	
Barium	140,000	910,000	mg/kg	110	85	86	
Beryllium	4,100	2,100	mg/kg	0.57 U	0.43 U	0.61	
Cadmium	2,000	2,800	mg/kg	2.3	1.1	0.41	
Calcium	NA	NA	mg/kg	69,000	53,000	6,800	
Chromium	6,100	420	mg/kg	28	21	15	
Cobalt	120,000	NA	mg/kg	12	10	4.8	
Copper	82,000	NA	mg/kg	210	68	19	
Iron	NA	NA	mg/kg	24,000	23,000	21,000	
Lead	800	NA	mg/kg	150	70	36	
Magnesium	NA	NA	mg/kg	32,000	32,000	2,700	
Manganese	41,000	91,000	mg/kg	380	400	160	

Table 4-3
Soil Analytical Results Summary Table
Polychem Services Site
Chicago Heights, Cook County, Illinois

Parameter ¹	Laboratory Sample ID		1201631-14		1201631-15		1201631-16	
	Matrix		Soil		Soil		Soil	
	Location ID		S-01		S-01		S-02	
	Sampling Date		1/26/2012		1/26/2012		1/26/2012	
Regulatory Limit	Field Sample ID		PS-S01-012612		PS-S01D-012612		PS-S02-012612	
	TACO I/C-Ing	TACO I/C-Inh	Unit		Result			
Nickel	41,000	21,000	mg/kg		30		24	
Potassium	NA	NA	mg/kg		1,400		1,200	
Selenium	10,000	NA	mg/kg		1.5		1.4	
Silver	10,000	NA	mg/kg		1.6		0.54 U	
Sodium	NA	NA	mg/kg		2,200		1,300	
Vanadium	14,000	NA	mg/kg		24		20	
Zinc	610,000	NA	mg/kg		1,200		480	
Mercury	610	16	mg/kg		0.18		0.33	

Notes:

Shaded and bolded results exceed the IEPA TACO I/C-Ing or TACO I/C-Inh regulatory limits.

ID = Identification

IEPA = Illinois Environmental Protection Agency

I/C-Ing = Industrial/Commercial Ingestion

I/C-Inh = Industrial/Commercial Inhalation

J = Estimated result

mg/kg = Milligram per kilogram

NA = Not applicable

SVOC = Semivolatile organic compound

TACO = Tiered Approach to Corrective Action

TAL = Target Analyte List

TCL = Target Compound List

U = Not detected at listed reporting limit

VOC = Volatile organic compound

1 Only detected parameters listed

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION



Site: Polychem Services Site

Photograph No.: 1

Direction: Southeast

Subject: Polychem Services chemical conversion facility and staged drums in northwest region of the Site

Date: 2/1/12

Photographer: David Sena



Site: Polychem Services Site

Photograph No.: 2

Direction: South

Subject: Drums staged in west region of the Site

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

Photograph No.: 3

Direction: Northwest

Subject: Drums staged in northwest region of the Site

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

Photograph No.: 4

Direction: North

Subject: Drums and totes staged in northeast region of the Site

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

Photograph No.: 5

Direction: Northeast

Subject: WESTON START conducting air monitoring in northeast region of the Site next to drums

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

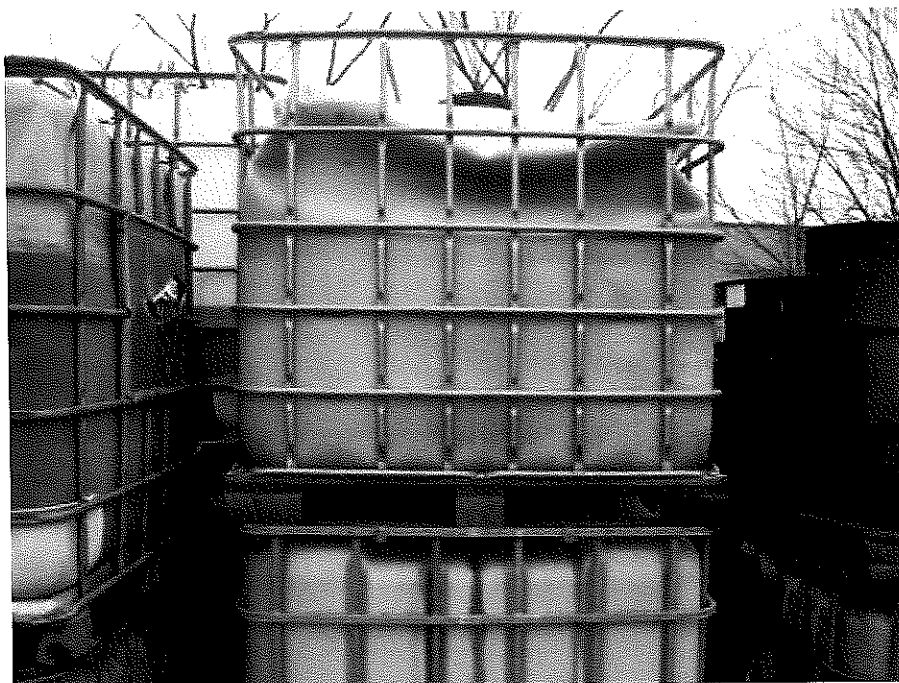
Photograph No.: 6

Direction: East

Subject: Containers staged in east region of the Site

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

Photograph No.: 7

Direction: North

Subject: Damaged and cracked 270-gallon totes in northeast region of the Site

Date: 1/26/12

Photographer: David Sena



Site: Polychem Services Site

Photograph No.: 8

Direction: East

Subject: Black resin spilled onto ground from open tote in southeast region of the Site

Date: 1/25/12

Photographer: Jeff Bryniarski



Site: Polychem Services Site

Photograph No.: 9

Direction: Southwest

Subject: WESTON START collecting liquid waste sample PS-WL12-012612 from a drum in the west region of the Site

Date: 1/26/12

Photographer: Jon Colomb



Site: Polychem Services Site

Photograph No.: 10

Direction: Southwest

Subject: WESTON START collecting liquid waste sample PS-WL08-012612 from a drum in the northwest region of the Site

Date: 1/26/12

Photographer: Jon Colomb

APPENDIX B
LABORATORY ANALYTICAL AND DATA VALIDATION REPORTS

**POLYCHEM SERVICES, INC.
CHICAGO HEIGHTS, ILLINOIS
DATA VALIDATION REPORT**

Date: February 8, 2012

Laboratory: ALS Environmental (ALS), Holland, Michigan

Laboratory Project #: 1201628

Data Validation Performed By: Lisa Graczyk, Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START)

Weston Analytical Work Order #/TDD #: 20405.016.001.1723.00/S05-0001-1201-012

This data validation report has been prepared by WESTON START under the START III Region V contract. This report documents the data validation for 4 waste liquid, 1 waste solid, 1 water, and trip blank samples collected for the Polychem Services, Inc. Site Assessment that were analyzed for the following parameters and U.S. Environmental Protection Agency (U.S. EPA) methods:

- Volatile Organic Compounds (VOC) by SW-846 Method 8260B
- Toxicity Characteristic Leaching Procedure (TCLP) VOCs by SW-846 Methods 1311 and 8260B
- Semivolatile Organic Carbons (SVOC) by SW-846 Method 8270C
- TCLP SVOCs by SW-846 Methods 1311 and 8270C
- Metals by SW-846 Methods 6020A, 7471A, and 7470A
- Ignitability by ASTM D93
- Corrosivity by SW-846 Methods 9040 and 9045

A level II data package was requested from ALS. The data validation was conducted in general accordance with the U.S. EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated June 2008 and "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review" dated January 2010. The Attachment contains the results summary sheets with the hand-written qualifiers applied during data validation.