Focused Site Inspection Prioritization

Alco Springs Industries
USEPA ID No. ILD 048 300 412

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For U.S. Environmental Protection Agency, Region V

Approved by: Alan Alter Date: 9/27/95

For Illinois Environmental Protection Agency

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1.0 Introduction

On December 13, 1994, Black & Veatch Waste Science, Inc. (BVWS), was authorized, by approval of the work plan amendment by the U.S. Environmental Protection Agency (USEPA) Region V, to conduct a focused site inspection prioritization (FSIP) of the Alco Springs Industries site in Chicago Heights, Cook County, Illinois.

The site was initially placed on the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) on January 28, 1986, as a result of a request for discovery action initiated by the Illinois Environmental Protection Agency (IEPA).

The facility received its initial Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) evaluation in the form of a preliminary assessment (PA) report completed by IEPA, on May 21, 1986. In July 1987, the USEPA Field Investigation Team contractor conducted a screening site inspection report (SSI), which included the collection and analysis of three residential well samples. The sampling portion of this FSIP was conducted on March 27 and 28, 1995, when the Alternative Remedial Contracting Strategy (ARCS) V contractor field team collected two groundwater samples, one drinking water well sample, three sediment samples, and three soil samples.

The objective of the FSIP is to review the outstanding SSIs performed before the implementation of the revised Hazard Ranking System (HRS) for which a final decision has not been made regarding further action. The FSIP will determine whether the existing SSI information meets a minimum standard to reflect the revised HRS. If not, additional information will be collected by file review, reconnaissance and sampling on an as-needed basis. The FSIP will evaluate the threats posed to human health and the environment and provide sufficient documentation for USEPA to decide the appropriate future course of action (No Further Remedial Action Planned [NFRAP], further evaluation, or preparation of an HRS scoring package).

2.0 Site Background

2.1 Introduction

This section includes information obtained during the FSIP and from reports of previous site activities.

2.2 Site Description

The Alco Springs Industries site is located on 23rd Street and Euclid on a 20-acre parcel of land in Chicago Heights, Cook County, Illinois (northwest quarter of the southeast quarter of Section 29, Township 35 North, Range 14 East). Figure 2-1 is a site location map; Figure 2-2 is a site sketch.

Alco Springs Industries is a manufacturer of steel springs for heavy machinery. The site is active and consists of facility buildings on the eastern side of the property, a landfill in the middle, and a low marsh area on the western side of the property. The landfill slopes 25 feet into standing water and trees. The landfill is approximately 300 feet by 150 feet. A one-foot high berm extends from the northern property boundary to a pathway along the southern property boundary. Surface water runoff flows into Thorn Creek, which is approximately 50 feet west of the berm (ARCS V Contractor 1995).

The site is located in a suburban area. The site is bounded by the Elgin Joliet and Eastern Railroad to the north, Thorn Creek to the west, 26th Street to the south, and Euclid Street to the east. Surrounding land use within 0.25 mile of the site includes residential areas to the northwest and east, and recreational areas to the southwest, north, and west within Sauk Trail Forest Preserve and Cook County Forest Preserve. General land use within 4 miles includes residential areas, recreational areas within the forest preserves, and light industrial areas (ARCS V Contractor 1995, USGS 1983). Appendix A includes the 4-mile radius and 15-mile surface water route map.

2.3 Site History

2.3.1 Operational History

Operations at the site began in 1913 on 42 acres of land as a division of American Locomotive. In 1972, 20 acres were sold to Sun Steel Company, an adjacent facility, and Alco Springs Industries became part of Studebaker Corporation, the parent company (E&E 1988).

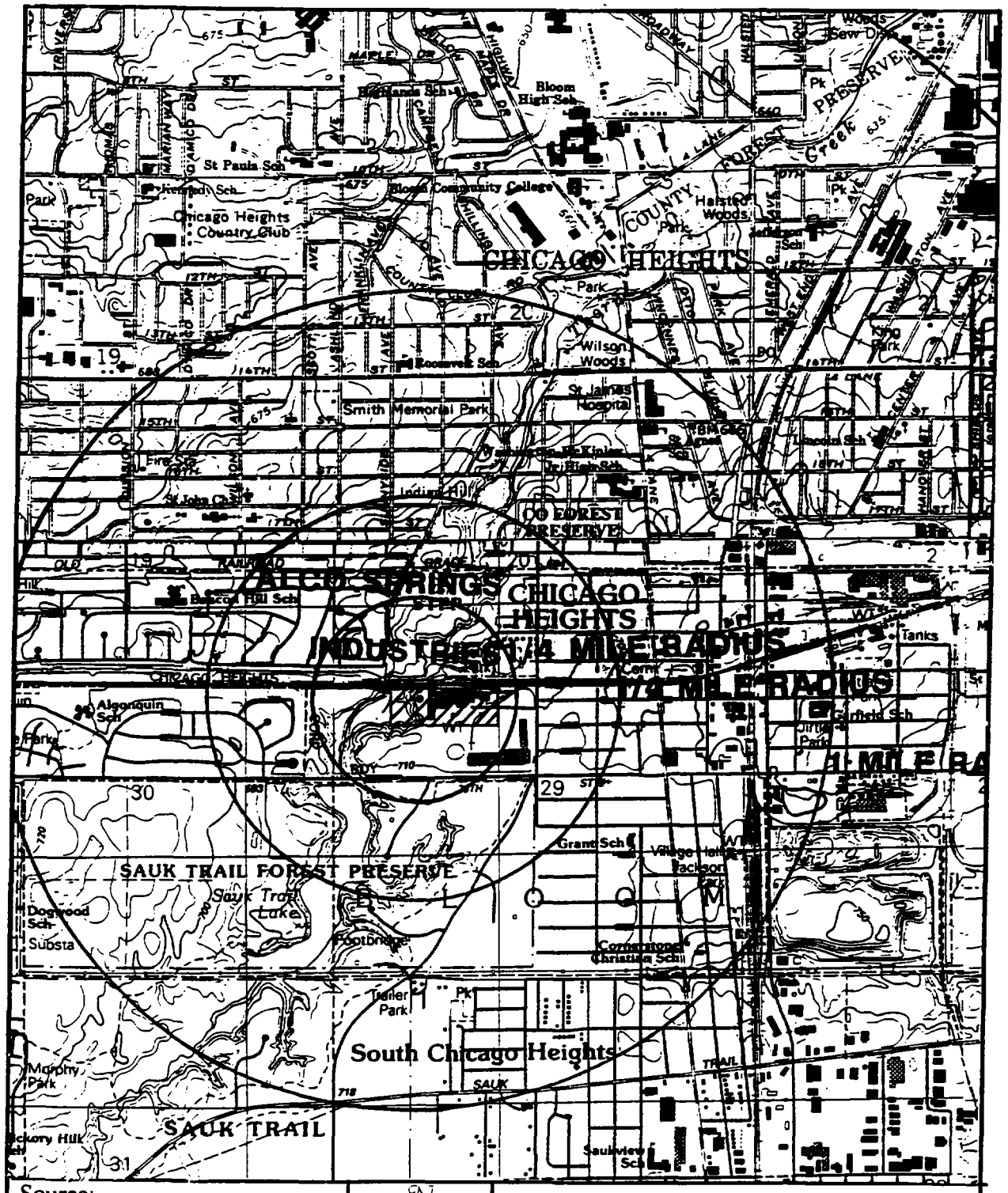
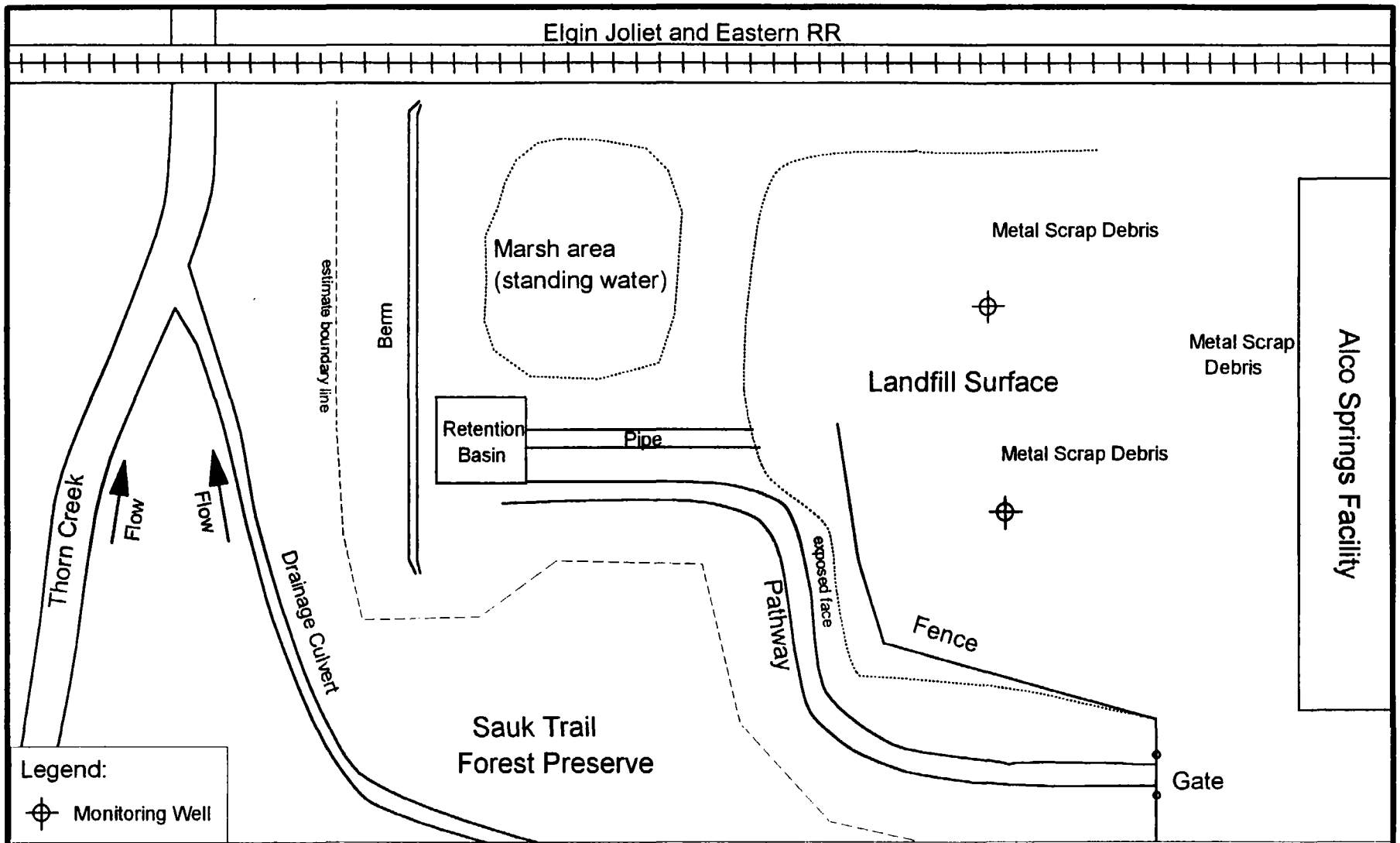


Figure 2-1
Site Location Map

Alco Springs Industries
Chicago Heights, Illinois



Source:
1995 ARCS Contractor Site Reconnaisance

Scale: Not To Scale

Figure 2-2
Site Sketch

Alco Springs Industries
Chicago Heights, Illinois

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The steel spring manufacturing process involves submerging steel springs in a quench oil bath to remove the metal scale. Quench oil metal bath sludge is created when the quench oil is filtered and is regulated as a special waste (F010) (E&E 1988). The sludge wastes are stored in a 30 cubic yard dumpster. The sludge waste collected and hauled by Skyline Disposal to the CID Landfill every two years as the dumpster reaches half of its capacity. Before the acquisition of a quench oil reclaiming system in 1980, oil was cooled and directed to a retention basin behind the facility. Oil was skimmed from the surface and the remaining water was discharged into Thorn Creek (E&E 1988). The retention basin is no longer in use.

Concrete, empty drums, pallets, scrap steel, steel grindings, and general refuse were disposed in the unpermitted landfill before 1981, when it was covered with a 2-foot clay cap; however, a portion of the landfill face is exposed along the southwestern face (ARCS V Contractor 1995).

2.3.2 Summary of Onsite Environmental Work

IEPA records indicate operational violations were documented during inspections, including operating an unpermitted landfill. The site was first brought to public attention by a complainant, alleging that discharges from Alco Springs Industries and an adjacent company, Sun Steel, were polluting a tributary of Thorn Creek. IEPA investigated the complaint on November 19, 1980, when it discovered 100 to 120 drums containing oil and scale were stored south of the landfill. In November 1981, the IEPA responded to another complaint alleging the dumping of wastes; the drums found one year earlier were empty. The IEPA collected soil samples from the fill face and earthen berm located west of the standing water and trees. Water samples were collected from Thorn Creek (E&E 1988). Analytical results were not available with the file information.

In May 1987, the USEPA Field Investigation Team contractor collected residential well samples from a South Chicago Heights Water Department well, a Park Forest Water Department well, and a Cook County Forest Preserve well. Lead and copper were detected in the sample from the Cook County Forest Preserve well (E&E 1988).

Current environmental activity at the Alco Springs Industries site is limited to this FSIP.

2.4 Applicability of Other Statutes

The Alco Springs Industries site was first listed on the CERCLIS site/event list for Illinois on January 28, 1986, under identification number ILD 048 300 412 (USEPA 1995). The site is listed as a full quantity generator on the Resource Conservation and Recovery Act (RCRA) notifiers list (USEPA 1994).

3.0 Site Inspection Activities and Analytical Results

3.1 Introduction

This section outlines procedures used and observations made during the FSIP conducted at the Alco Springs Industries site. Sampling activities were conducted in accordance with the quality assurance project plan (QAPjP) (ARCS V Contractor 1991).

Samples collected for this FSIP were analyzed for organic and inorganic substances contained on the USEPA target compound list (TCL) and target analyte list (TAL) by USEPA contract laboratory program (CLP) participant laboratories. Appendix B presents the TCL and TAL. Appendix C presents a summary of all analytical data generated by FSIP sampling. Appendix D contains photographs of the site and sample locations.

3.2 Site Reconnaissance

On February 7, 1995, a reconnaissance of the Alco Springs Industries site was conducted. This visit consisted of a visual site inspection to determine the status of the site, to identify health and safety hazards, and to identify potential sampling locations.

A small drainage culvert was observed to originate at a drainage pipe exposed at the base of the slope of the landfill where the lower elevation begins. The pipe is no longer used, but the culvert does collect intermittent drainage from the higher elevation. The culvert empties into Thorn Creek west of the property boundary. The Elgin Joliet and Eastern Railroad is at the northern site boundary, which is elevated 25 feet above Thorn Creek. A 30-foot cracked concrete pipe was observed coming out of the base of the landfill and emptying into a retention basin. Process water was emptied into the retention basin, and oil was skimmed from the surface before the water was discharged into Thorn Creek. This system is no longer in operation.

A section of the landfill is exposed along the slope face at the southwestern corner of the landfill. Uncovered refuse, fire brick, metal scrap, cement debris, crushed emptied drums, and hardened oil and grease drip lines were observed. Rusty scrap metal debris is in several areas on the landfill surface and behind the facility building. Two 2-inch diameter polyvinyl chloride monitoring wells were observed. One well, located at the south-central section, was flush mounted; the other, located

at the north-central section, was uncapped and had a 2-foot stickup above the surface.

3.3 Site Representative Interview

Site representatives Gordon Sharkey, plant manager, and Jim Lynch, plant foreman, were interviewed at the site by the reconnaissance team on February 7, 1995. The reconnaissance team explained the purpose of the FSIP, and gathered site-specific information.

It was stated that the two onsite monitoring wells were installed by IEPA and sampled in the past; however, the sampling schedule was unknown. An onsite production well is only used as process water. Facility workers drink bottled water only. Thirty-six workers are employed at the site (ARCS V Contractor 1995).

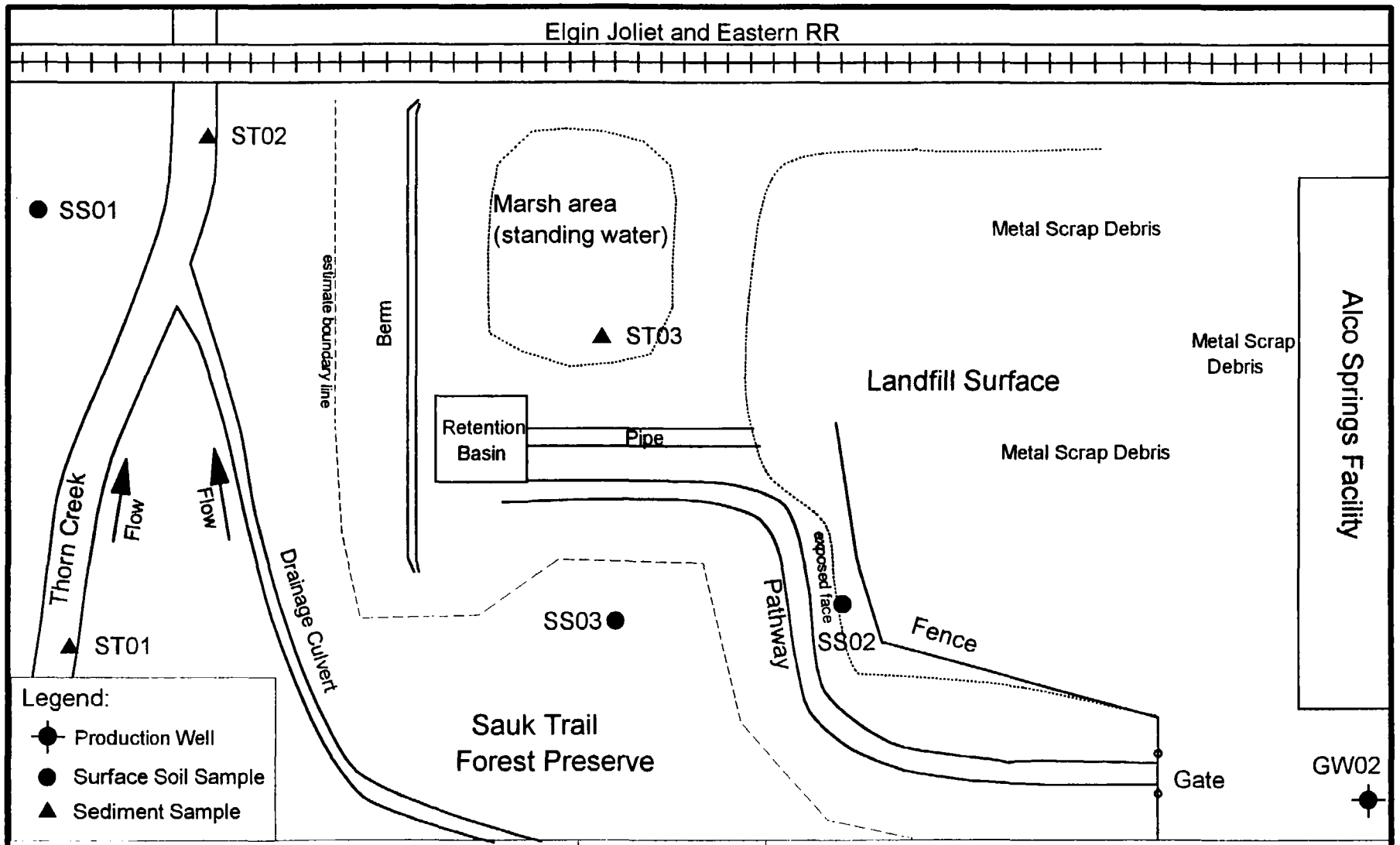
3.4 Groundwater Sampling

On March 27, 1995, the ARCS V contractor field team collected two groundwater samples: one from the onsite production well, and one from the hand pump well located within Sauk Trail Forest Preserve. No samples were collected from the onsite monitoring wells because of low recovery rates and low water volume. Well sample GW01 was collected from the forest preserve hand pump well to determine a potential release to groundwater. Well sample GW02 was collected from the onsite production well to determine onsite groundwater quality. Representatives of Alco Springs Industries collected split samples. Figure 3-1 shows onsite sample locations. Figure 3-2 shows offsite sample locations. Table 3-1 provides a summary of sample locations and descriptions.

Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories in accordance with procedures set forth in the QAPjP.

Groundwater samples scheduled for organic and inorganic analyses were shipped to Compuchem Environmental Corp. in Research Triangle Park, North Carolina, on March 27, 1995. Samples were analyzed for TCL and TAL substances under a routine analytical services request.

All reusable sampling and personal protective equipment were decontaminated before transport offsite. Disposable sampling items and personal protective equipment were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.



Source:
1995 ARCS Contractor Site Reconnaisance

Scale: Not To Scale

Figure 3-1
Onsite Sample Location Map

Alco Springs Industries
Chicago Heights, Illinois

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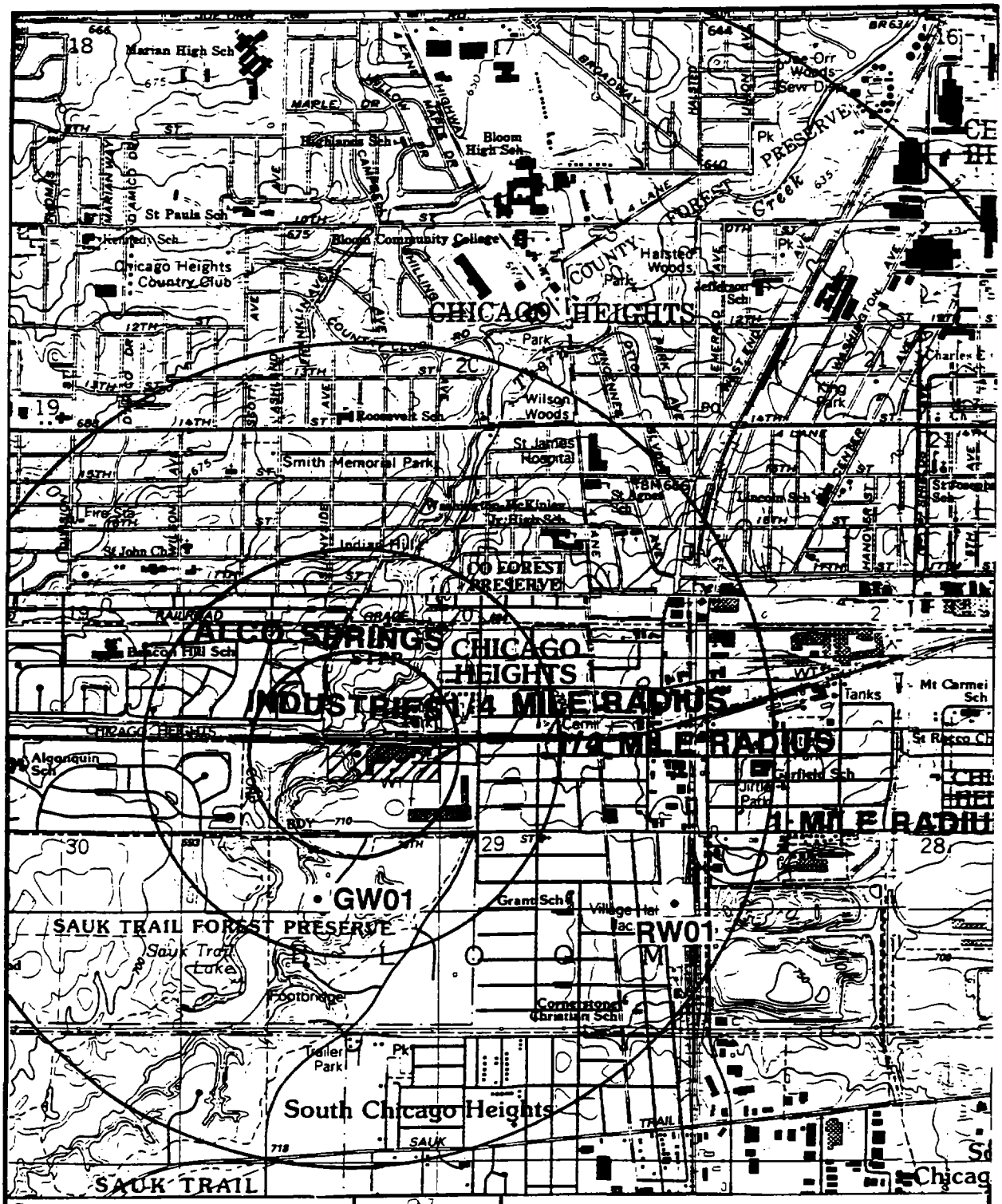

Source:
USGS 7.5 topographic maps
Steger 1990 and Harvey 1993

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Figure 3-2
Offsite Sample Location Map

Alco Springs Industries
Chicago Heights, Illinois

Table 3-1 Sample Descriptions Alco Springs Industries			
Sample	Depth	Appearance	Location
GW01	Unknown	Initial purge water red, later clears	Sauk Trail Forest Preserve pump well
GW02	75 - 79 feet	Clear, strong sulfur	Onsite production well
RW01	493 feet	Clear	South Chicago Heights municipal well located at 2729 Jackson Street
ST01	0 - 6 inches	Brown clayey sand	Eastern bank of Thorn Creek, 200 feet upstream of the site
ST02	0 - 6 inches	Brown sandy clay/silt, with decomposing organics	Eastern bank of Thorn Creek, 100 feet downstream of confluence of drainage culvert and Thorn Creek
ST03	0 - 6 inches	Dark brown, organic-rich soil, strong decomposition odor	Marsh area below the landfill
SS01	0 - 6 inches	Brown silty sand	West of Thorn Creek and south of railroad tracks
SS02	0 - 6 inches	Brown sandy silt	Exposed face of landfill
SS03	0 - 6 inches	Gray, brown sandy clay with leaves and gravel	Between drainage culvert and pathway

3.5 Drinking Water Well Sampling

On March 28, 1995, the ARCS V contractor field team collected one drinking water well sample. Well sample RW01 was collected from a South Chicago Heights municipal well located at 2729 Jackson Street approximately 0.75 mile from the landfill (Figure 3-2). The sample was collected to serve as a background sample for the aquifer of concern. Representatives of Alco Springs Industries did not collect split samples. Table 3-1 provides a summary of sample locations and descriptions.

Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories in accordance with procedures set forth in the QAPjP.

Residential well samples scheduled for organic and inorganic analyses were shipped to Compuchem Environmental Corp. in Research Triangle Park, North Carolina, on March 28, 1995. Samples were analyzed for TCL and TAL substances under a special analytical services request for low concentration drinking water.

All reusable sampling and personal protective equipment were decontaminated before transport offsite. Disposable sampling items and personal protective equipment were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.

3.6 Sediment Sampling

On March 28, 1995, the ARCS V contractor field team collected three sediment samples from the marsh area and on the eastern banks of Thorn Creek. Sediment sample ST01 was collected approximately 200 feet south (upstream) of the location where the drainage culvert intersects the eastern bank of Thorn Creek. ST01 will serve as the background sediment sample. Sediment sample ST02 was collected approximately 100 feet downstream of the confluence of the drainage culvert and the eastern bank of Thorn Creek to document a potential release to Thorn Creek. Sediment sample ST03 was collected from the onsite marsh area, approximately 50 feet west of the landfill, to document a release to onsite sediments. Split samples were provided to representatives of the Alco Springs Industries site. Figure 3-1 shows onsite sample locations. Table 3-1 provides a summary of sample locations and descriptions.

Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories in accordance with procedures set forth in the QAPjP.

Sediment samples scheduled for organic analyses were shipped to Industrial Environmental Analysts, Inc., in Whippany, New Jersey, on March 28, 1995.

Sediment samples scheduled for inorganic analyses were shipped to Chemtech Consulting Group in Englewood, New Jersey, on March 28, 1995. Samples were analyzed for TCL and TAL substances under a routine analytical services request.

All reusable sampling and personal protective equipment were decontaminated before transport offsite. Disposable sampling items and personal protective equipment were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.

3.7 Soil Sampling

On March 28, 1995, the ARCS V contractor field team collected three surface soil samples. Soil sample SS01 was collected west of Thorn Creek and south of the railroad tracks and will serve as the background sample. Soil sample SS02 was collected on the exposed face of the landfill to document the landfill as a source area. Soil sample SS03 was collected between the drainage culvert and the pathway to determine a potential release to surficial soils. Representatives of Alco Springs Industries did not collect split samples. Figure 3-1 shows onsite sample locations. Table 3-1 provides a summary of sample locations and descriptions.

Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories in accordance with procedures set forth in the QAPjP.

Soil samples scheduled for organic and inorganic analyses were shipped to Compuchem Environmental Corp. in Research Triangle Park, North Carolina, on March 28, 1995. Samples were analyzed for TCL and TAL substances under a routine analytical services request.

All reusable sampling and personal protective equipment were decontaminated before transport offsite. Disposable sampling items and personal protective equipment were discarded in accordance with procedures outlined in the FSIP project work plan and the QAPjP.

3.8 Analytical Results

This section summarizes analytical results from FSIP samples. Appendix C presents all FSIP analytical data.

Laboratory analysis of the groundwater samples revealed the presence of inorganic analytes. Laboratory analysis of the sediment samples revealed the presence of semivolatile organic compounds, polychlorinated biphenyls, pesticides,

and inorganic analytes. Laboratory analysis of the soil samples revealed the presence of semivolatile organic compounds, pesticides,and inorganic analytes.

3.9 Key Samples

Key samples are those samples that contain substances in sufficient concentration to document an observed release. Table 3-2 identifies FSIP key samples.

Key groundwater samples revealed the presence of cobalt, manganese, and nickel. Key sediment samples revealed the presence of eleven semivolatile organic compounds, five pesticides, one polychlorinated biphenyl compound, and seven inorganic analytes. Key soil samples revealed the presence of thirteen semivolatile organic compounds, nine pesticides, and eight inorganic analytes.

Table 3-2 Key Sample Summary			
Groundwater (concentrations in $\mu g/L$)			
Substance	Sample Number		
	RW01 (Background)	GW01	GW02
Cobalt	6 U		22.0 B
Manganese	42	199	331
Nickel	20 U		22.9 B

Notes:

U Substance is undetected. The reported value is the contract required quantitation limit.

B Indicates that the reported value is less than the contract required detection limit, but greater than or equal to the instrument detection limit.

Table 3-2 (Continued) Key Sample Summary					
Sediment (concentrations in μg/Kg)					
Substance	Sample Number				
	ST01 (Background)		ST02		ST03
Anthracene	450	U	510	J	
Benzo(a)anthracene	89	J	2,500	J	
Benzo(b)fluoranthene	91	J	2,100	J	
Benzo(k)fluoranthene	120	J	2,000	J	
Benzo(g,h,i)perylene	450	U	1,700	J	
Benzo(a)pyrene	93	J	2,400	J	
Chrysene	100	J	2,900	J	
Fluoranthene	270	J	1,600		
Indeno(1,2,3-cd)pyrene	450	U	1,600	J	
Phenanthrene	150	J	1,200		
Pyrene	220	J	4,600	J	
4,4'-DDD	5.1	P	30	P	
Endosulfan sulfate	4.4	U	7.2	P	
Methoxychlor	23	U	40	P	
Endrin ketone	4.4	U	25	P	
Alpha-chlordane	1.3	JP	4.7	P	
Aroclor-1254	44	U	170		
Antimony	1,300	U	1,900	B	
Arsenic	4,800	J	17,400		
Calcium	12,000,000		76,100,000		49,300,000
Copper	21,900		303,000		
Lead	23,000		77,600		
Manganese	155,000		487,000		
Zinc	57,500		201,000		

Notes:

- J Reported value is estimated.
- U Substance is undetected. The reported value is the contract required quantitation limit.
- P Greater than twenty-five percent difference for detected concentrations.
- B Indicates that the reported value is less than the contract required detection limit, but greater than the instrument detection limit.

Table 3-2 (Continued) Key Sample Summary						
Soil (concentrations in μg/Kg)						
Substance	Sample Number					
	SS01 (Background)		SS02		SS03	
Anthracene	410	U	1,000			
Benzo(a)anthracene	61	J	5,000	D	240	J
Benzo(b)fluoranthene	110	JX	6,400	DX	520	JX
Benzo(k)fluoranthene	110	JX	6,000	DX	470	JX
Benzo(g,h,i)perylene	410	U	2,400		1,000	J
Benzo(a)pyrene	54	J	4,000	D	250	J
Chrysene	78	J	4,000	D	320	J
Dibenzo(a,h)anthracene	410	U	590			
Fluoranthene	100	J	5,200	D		
Fluorene	410	U	590			
Indeno(1,2,3-cd)pyrene	410	U	2,400			
Phenanthrene	65	U	3,000	D	340	J
Pyrene	96	J	7,100	D	800	
Aldrin	0.38	J			8.1	JP
Heptachlor epoxide	2.1	U			2.3	JP
Endosulfan I	2.1	U			2.3	J
4,4'-DDE	2.8	JP			7.4	P
4,4'-DDD	1.8	JP			23	JP
4,4'-DDT	4.8	P			46	JD
Methoxychlor	21	U	21	P		
Alpha-chlordane	2.1	U			3.3	JP
Gamma-chlordane	2.1	U			6.1	J

Notes:

- J Reported value is estimated.
- P Greater than twenty-five percent difference for detected concentrations.
- U Substance is undetected. The reported value is the contract required quantitation limit.
- D This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- X Results could not be distinguished.

Table 3-2 (Continued) Key Sample Summary			
Soil (concentrations in μg/Kg)			
Substance	Sample Number		
	SS01 (Background)	SS02	SS03
Calcium	13,200,000	40,400,000	104,000,000
Chromium	10,800 B	183,000	79,400
Cobalt	6,400 JE	22,100	
Copper	12,800	38,500 JE	102,000 JE
Iron	9,860,000		53,100,000
Magnesium	7,710,000	42,200,000	71,700,000
Manganese	309,000	1,080,000	
Nickel	11,800	366,000	45,900

Notes:

J Reported value is estimated.

B Indicates that the reported value is less than the contract required detection limit, but greater than or equal to the instrument detection limit.

E The reported value is estimated because of the presence of interference.

4.0 Characterization of Sources

4.1 Introduction

Analysis of FSIP samples led to the identification of one source area, the landfill, at the Alco Springs Industries site.

4.2 Landfill

4.2.1 Description

The landfill is approximately 300 feet long, 150 feet wide, and 25 feet deep. The volume of the landfill is approximately 41,667 cubic yards and the surface area is approximately 45,000 square feet.

Concrete, empty drums, pallets, scrap steel, steel grindings, and general refuse were disposed in the unpermitted landfill before 1981, when it was covered with a 2-foot clay cap; however, a portion of the landfill face is exposed along the southwestern face (ARCS V Contractor 1995).

4.2.2 Waste Characteristics

Analysis of soil sample, SS02, which was collected from the exposed face of the landfill, revealed the presence of thirteen semivolatile organic compounds, including anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene; one pesticide (methoxychlor); and seven inorganic analytes, including calcium, chromium, cobalt, copper, magnesium, manganese, and nickel.

Analytical data indicate the migration of 15 potential contaminants from the landfill area has affected the surface water pathway, and three potential contaminants from the landfill area have affected the groundwater pathway. Anthracene, benzo(a)anthracene, benzo(b)fluoranthrene, benzo(k)fluoranthene, benzo(g,h,i)perylene,benzo(a)pyrene,chrysene,fluoranthene,indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, methoxychlor, calcium, copper, and manganese were detected in the downstream sediment sample ST02 at elevated concentrations (3 times background concentration) and can be attributed to the landfill. Cobalt, manganese, and nickel were detected in the onsite production well at elevated concentrations. Manganese was detected in a forest preserve well adjacent to the site. Sixteen

additional potential contaminants were detected at elevated concentrations above background levels in sediment sample ST02 and in onsite soil sample SS03: aldrin, endosulfan sulfate, endosulfan I, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, endrin ketone, heptachlor epoxide, alpha-chlordane, gamma-chlordane, Aroclor-1254, antimony, arsenic, iron, lead, and zinc. The source of these potential contaminants could not be identified. Evidence of release of these potential contaminants is documented in onsite soils, sediment, and groundwater. This causes the groundwater, surface water, and soil exposure pathways to be of concern. A potential also exists for detected chemicals to be entrained and transported in the air pathway as airborne particulate matter.

5.0 Discussion of Migration Pathways

5.1 Introduction

This section includes useful information in analyzing the potential impact of contaminants found at the Alco Springs Industries site on the four migration pathways: groundwater, surface water, air, and soil.

5.2 Groundwater

One drinking water well sample and two groundwater well samples were collected as part of this FSIP. The residential well sample was collected from a South Chicago Heights municipal well approximately 0.75 mile southeast of the site and served as the background sample. Groundwater sample GW02 was collected from an onsite production well located approximately 200 feet southeast of the landfill. The production well is only used for process water. Groundwater sample GW01 was collected from a forest preserve hand pump well approximately 0.3 mile south of the landfill. This well only serves a transient population. Analysis of the groundwater well samples indicated the release of three inorganic analytes associated with the landfill at levels significantly above background concentrations.

Information regarding the geology of the site area indicates the presence of three major water-bearing units. The three aquifers, in descending order, are glacial drift deposits, a Silurian dolomite bedrock formation, and the Cambrian-Ordovician aquifer system, which is a sequence of hydraulically connected Ordovician and Cambrian dolomite and sandstone formations (Bruce Yare and Associates 1982, Willman and others 1967).

According to well logs in the area, the glacial drift aquifer and the Silurian dolomite bedrock aquifer appear to be hydraulically connected and together form the aquifer of concern (AOC). The glacial drift deposit ranges in thickness from 5 to 40 feet, and is composed of generally well-sorted, well-bedded sands and gravels near the site (Bruce Yare and Associates 1982). The Silurian dolomite is an approximately 500-foot thick formation consisting of two layers: the Niagarian series overlying the Alexandrian series. The Niagarian series is a very fine crystalline to granular compact to porous dolomite, with some dolomitic siltstone. The Alexandrian series consists of approximately 40 to 80 feet of dolomite with chert and shale interbedded within the dolomite. The Ordovician Maquoketa Shale Formation, an aquitard, lies between the AOC and the lower Cambrian-Ordovician aquifer system.

The Ordovician system consists of alternating dolomite, shale, and sandstone layers underlying the Silurian system. The Ordovician system ranges from approximately 700 feet to 1,000 feet thick (Illinois State Geological Survey 1971).

Potable water within a 4-mile radius of the site is obtained from public wells. Municipal water is served by Steger, Park Forest, Ford Heights, Richton Park, and South Chicago Heights municipalities. Steger operates three wells from a blended system that draws all its water from the Silurian aquifer system and serves approximately 9,600 people. The wells are located within 4 miles of the site. Park Forest operates six active municipal wells that are part of a blended system that serves approximately 24,656 people. These wells draw water from the Silurian aquifer system. Ford Heights operates four wells in a blended system that serves approximately 5,100 people. Four Ford Heights wells are located within 4 miles of the site and are screened in the Silurian aquifer. Richton Park operates three wells in a blended system that serve approximately 11,000 people. Two Richton Park wells are within 4 miles of the site; one well draws water from the Silurian aquifer and one well draws water from the Ordovician aquifer. South Chicago Heights operates three wells that serve approximately 3,700 people. The three wells are located within 4 miles of the site and draw water from the Silurian aquifer (IEPA 1992, USGS 1990 - 1993). These municipal wells are located in a wellhead protection area.

An estimated total of 50,388 people use potable water within 4 miles of the site and are radially distributed as follows: 0 - 0.25 mile, 0 people; 0.25 - 0.5 mile, 0 people; 0.5 - 1 mile, 5,342 people; 1-2 miles, 27,270 people; 2-3 miles, 9,009 people, and 3-4 miles, 8,767 people (IEPA 1992, USGS 1990 - 1993).

5.3 Surface Water

Thorn Creek flows north along the western border of the site. Surface water runoff from the landfill flows approximately 150 feet into a drainage culvert on the western end of the site that flows 200 feet north and empties into Thorn Creek. The probable point of entry (PPE) is the confluence of the drainage ditch and Thorn Creek. Thorn Creek flows north approximately 11.35 miles and then enters the Little Calumet River for the remainder of the 15-mile target distance limit (USGS 1990 - 1993). The site is located in a 500-year floodplain (U.S. Department of Housing and Urban Development 1979).

As part of the FSIP, three sediment samples were collected. Sediment sample ST01 was collected as a background sample approximately 200 feet upstream of the

PPE. Sediment sample ST02 was collected in Thorn Creek approximately 100 feet downstream of the PPE. Sediment sample ST03 was collected in an onsite marsh area to determine a potential release to onsite sediments. Analytical results revealed the presence of eleven semivolatile organic compounds, one pesticide, and three inorganic analytes in ST02 and ST03 that can be attributed to the Alco Springs Industries site.

According to the National Wetlands Inventory, there are approximately 17.4 miles of wetland frontage along the 15-mile target distance limit; 0.68 miles of the wetland frontage begins at the PPE in Thorn Creek (USDI 1983, 1984). Thorn Creek and the Little Calumet River are perennial surface water bodies and are recreationally fished. These surface water bodies are also used for recreational purposes (Cook County Forest Preserve 1995). The annual average flowrates for the years 1949 through 1993 for Thorn Creek and the Little Calumet River are 38.7 cubic feet per second (cfs) and 188.8 cfs, respectively (USGS 1993). No known surface water intakes exist along the 15-mile target distance limit. No habitats for any threatened or endangered species are located along the surface water pathway (Illinois Department of Conservation [IDOC] 1994).

5.4 Air

No documented air releases are known and none was observed during the FSIP; however, the presence of chemicals at or near the ground surface creates the potential for windblown particulates to carry chemicals to neighboring residences.

An estimated 110,816 people live within 4 miles of the site (USEPA 1983, USGS 1990). Chicago Heights and South Chicago Heights are located within the 4-mile target distance ring. There are two residential areas within 0.25 mile of the site. The nearest residence is approximately 800 feet west of the site and the nearest school is approximately 4,500 feet northeast of the site (USGS 1990 - 1993). Sensitive environments within 4 miles of the site include habitat for three state designated threatened or endangered birds and four state designated threatened or endangered plants (IDOC 1994). Approximately 390 acres of wetland areas are located within the 4-mile target distance ring (USDI 1983, 1984).

5.5 Soil

Three surface soil samples were collected at the Alco Springs Industries site during this FSIP. Soil sample SS01 was collected west of Thorn Creek and served

as a background sample. Chemical analysis of soil samples SS02 and SS03 indicated the presence of thirteen semivolatile organic compounds, nine pesticides, and eight inorganic analytes at concentrations significantly above background levels. The site is fenced, is easily accessible, and has no recreational use. It should be noted that the site fence is along the top of the landfill. People can walk across Thorn Creek to the open face of refuse on the landfill (ARCS V Contractor 1995). No residences are within 200 feet of the site. Approximately 17,532 people reside within 1 mile of the site (USEPA 1983, USGS 1990).

6.0 References

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Site Priority Recommendation

Alco Springs Industries

USEPA ID No. ILD 048 300 412

Further action is recommended for the Alco Springs Industries site because of a Hazard Ranking System (HRS) score of 61.55. The site covers approximately 20 acres in Chicago Heights, Cook County, Illinois. The HRS score reflects a hazardous waste quantity factor value of 10 for all pathways, except for surface water overland flow, which is 100, based on the landfill source volume of 41,667 cubic yards. The dimensions of the landfill are 300 feet long by 150 feet wide by 25 feet deep. Concrete, empty drums, steel grindings, and general refuse were disposed in the unpermitted landfill before 1981, when it was covered with a 2-foot clay cap.

The groundwater migration pathway score is 71.76 due to an observed release to the glacial drift/Silurian dolomite aquifer system and groundwater target population of 53,088 people.

The surface water migration pathway score is 100 based on an observed release to Thorn Creek and high target values. It is assumed that at least 1 pound of fish per year is caught in Thorn Creek and the Little Calumet River. There are 1.36 miles of wetland frontage along Thorn Creek subject to Level II concentrations and 15.59 miles of wetland frontage along Thorn Creek and the Little Calumet River subject to potential contamination.

The soil exposure pathway score is 0.62. The score is low because target populations are only subject to potential contamination. The air migration pathway score is 1.14 based on a potential to release of contaminants to 110,816 people within 4 miles of the site. Approximately 390 acres of wetland areas, two state-designated natural areas, and habitats for seven state-designated threatened or endangered birds and plants were identified within 4 miles of the site.

Appendix A

Alco Springs Industries

4-Mile Radius Map
15-Mile Surface Water Route Map

SDMS US EPA Region V

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APPENDIX A – 4-MILE RADIUS MAP & 15-MILE SURFACE WATER ROUTE MAP

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Appendix B

Alco Springs Industries

Target Compound List and
Target Analyte List

Target Compound List

Volatiles

Chloromethane
Bromomethane
Vinyl Chloride
Chloroethane
Methylene Chloride
Acetone
Carbon Disulfide
1,1-Dichloroethene
1,1-Dichloroethane
1,2-Dichloroethene (total)
Chloroform
1,2-Dichloroethane
2-Butanone
1,1,1-Trichloroethane
Carbon Tetrachloride
Bromodichloromethane
1,2-Dichloropropane
Cis-1,3-Dichloropropene
Trichloroethene
Dibromochloromethane
1,1,2-Trichloroethane
Benzene
trans-1,3-Dichloropropane
Bromoform
4-Methyl-2-pentanone
2-Hexanone
Tetrachloroethene
Toluene
1,1,2,2-Tetrachloroethane
Chlorobenzene
Ethyl benzene
Styrene
Xylenes (total)

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Compound List (Continued)

Semivolatiles

Phenol
bis(2-Chloroethyl) ether
2-Chlorophenol
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
2-Methylphenol
2,2-oxybis-(1-Chloropropane)*
4-Methylphenol
N-Nitroso-di-n-dipropylamine
Hexachloroethane
Nitrobenzene
Isophorone
2-Nitrophenol
2,4-Dimethylphenol
bis(2-Chloroethoxy) methane
2,4-Dichlorophenol
1,2,4-Trichlorobenzene
Naphthalene
4-Chloroaniline
Hexachlorobutadiene
4-Chloro-3-methylhenol
2-Methylnaphthalene
Hexachlorocyclopentadiene
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2-Chloronephthalene
2-Nitroaniline
Dimethylphthalate
Acenaphthylene
2,6-Dinitrotoluene
3-Nitroaniline
Acenaphthene
2,4-Dinitrophenol
4-Nitrophenol
Dibenzofuran
2,4-Dinitrotoluene
Diethylphthalate
4-Chlorphenyl-phenyl ether
Fluorene
4-Nitroaniline
4,6-Dinitro-2-methylphenol
N-Nitrosodiphenylamine
4-Bromophenyl-phenyl ether
Hexachlorobenzene
Pentachlorophenol
Phenanthrenel
Anthracene
Carbazole
Di-n-butylphthalate
Fluoranthene
Pyrene
Butyl benzyl phthalate
3,3-Dichlorbenzidine
Benzo(a)anthracene
Chrysene
bis(2-Ethylhexyl)phthalate
Di-n-Octyphthalate
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene
Indeno(1,2,3-cd)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene

*Previously known by the name of bis(2-chlorousipropyl)ether.

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Compound List (Continued)

Pesticide/PCB

alpha-BHC	4,4-DDT
beta-BHC	Methoxychlor
delta-BHC	Endrin ketone
gamma-BHC (Lindane)	Endrin aldehyde
Heptachlor	alpha-chlordane
Aldrin	gamma-chlordane
Heptachlor epoxide	Toxaphene
Endosulfan I	Aroclor-1016
Dieldrin	Aroclor-1221
4,4-DDE	Aroclor-1232
Endrin	Aroclor-1242
Endosulfan II	Aroclor-1248
4,4-DDD	Aroclor-1254
Endosulfan sulfate	Aroclor-1260

Source: Target Compound List for water and soil containing less than high concentrations of pesticides/aroclors, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Analyte List

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium	Sodium
Cobalt	Thallium
Copper	Vanadium
Iron	Zinc
Lead	Cyanide

Source: Target Analyte List in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Appendix C

Alco Springs Industries

Analytical Results

Appendix C

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Data Reporting Qualifiers
Definitions for Organic Chemical Data Qualifiers

U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

P - Greater than tenty-five percent difference for detected concentrations. The lower of the two values is reported and flagged with a "P".

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag must be used for a TIC as well as for a positively identified TCL compound

D- This flag identifies all compounds identified in an analysis at a secondary dilution factor.

X - Results could not be distinguished.

Data Reporting Qualifiers
Definitions for Inorganic Chemical Data Qualifiers

U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

J - Indicates an estimated value.

B - Indicates that the reported value is less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

E - The reported value is estimated because of the presence of interference

N - Indicates presumptive evidence of a compound.

Table C-1
Volatile Organic Analysis for Drinking Water Well Sample
Alco Springs Industries

Volatile Compound	Sample Locations and Number Concentrations in µg/L	
	RW01	RW01 (Duplicate)
Chloromethane	5 UB	4 UB
Vinyl Chloride	1 U	1 U
Bromomethane	1 U	1 U
Chloroethane	1 U	1 U
1,1-Dichloroethene	1 U	1 U
Acetone	3 U	3 U
Carbon Disulfide	1 U	1 U
Methylene Chloride	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U
1,1-Dichloroethane	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U
2-Butanone	3 U	3 U
Bromochloromethane	1 U	1 U
Chloroform	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U
Carbon Tetrachloride	1 U	1 U
Benzene	1 U	1 U
1,2-Dichloroethane	1 U	1 U
Trichloroethene	1 U	1 U
1,2-Dichloropropane	1 U	1 U
Bromodichloromethane	1 U	1 U
Cis-1,3-Dichloropropene	1 U	1 U
Toluene	1 U	1 U
4-Methyl-2-Pentanone	3 U	3 U
Trans-1,3-Dichloropropene	1 U	1 U
Tetrachloroethene	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U
2-Hexanone	3 U	3 U
Dibromochloromethane	1 U	1 U
1,2-Dibromoethane	1 U	1 U
Chlorobenzene	1 U	1 U
Ethylbenzene	1 U	1 U
m &/or p-Xylene	1 U	1 U
o-Xylene	1 U	1 U
Styrene	1 U	1 U
Bromoform	1 U	1 U
1,1,2,2-Tetrachlroethane	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U
Total Number of TICS *	0	0

* Number, not concentrations, of tentatively identified compounds (TICs).

Table C-1\alco\data\rw-vol.wk4 + bu disk

Table C-2 Semivolatile Organic Analysis for Drinking Water Well Sample Alco Springs Industries Site		
Semivolatile Compound	Sample Location and Number Concentrations in ug/L	
	RW01	RW01 (Duplicate)
Phenol	5 U	5 U
bis(2-Chloroethyl)ether	5 U	5 U
2-Chlorophenol	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U
Benzyl alcohol	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U
2-Methylphenol	5 U	5 U
Bis(2-Chloroisopropyl)ether	5 U	5 U
4-Methylphenol	5 U	5 U
N-Nitroso-di-n-propylamine	5 U	5 U
Hexachloroethane	5 U	5 U
Nitrobenzene	5 U	5 U
Isophorone	5 U	5 U
2-Nitrophenol	5 U	5 U
2,4-Dimethylphenol	5 U	5 U
Benzoic acid	20 U	20 U
bis(2-Chloroethoxy)methane	5 U	5 U
2,4-Dichlorophenol	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U
Naphthalene	5 U	5 U
4-Chloroaniline	5 U	5 U
Hexachlorobutadiene	5 U	5 U
4-Chloro-3-methylphenol	5 U	5 U
2-Methylnaphthalene	5 U	5 U
Hexachlorocyclopentadiene	5 U	5 U
2,4,6-Trichlorophenol	5 U	5 U
2,4,5-Trichlorophenol	20 U	20 U
2-Chloronaphthalene	5 U	5 U
2-Nitroaniline	20 U	20 U
Dimethylphthalate	5 U	5 U
Acenaphthylene	5 U	5 U
3-Nitroaniline	20 U	20 U
Acenaphthene	5 U	5 U
2,4-Dinitrophenol	20 U	20 U
4-Nitrophenol	20 U	20 U
Dibenzofuran	5 U	5 U
2,6-Dinitrotoluene	5 U	5 U
2,4-Dinitrotoluene	5 U	5 U
Diethylphthalate	5 U	5 U
4-Chlorophenyl-phenylether	5 U	5 U
Fluorene	5 U	5 U
4-Nitroaniline	20 U	20 U

Table C-2 (Continued) Semivolatile Organic Analysis for Drinking Water Well Sample Alco Springs Industries Site		
Semivolatile Compound	Sample Location and Number Concentrations in ug/L	
	RW01	RW01 (Duplicate)
4,6-Dinitro-2-methylphenol	20 U	20 U
N-Nitrosodiphenylamine	5 U	5 U
4-Bromophenyl-phenylether	5 U	5 U
Hexachlorobenzene	5 U	5 U
Pentachlorophenol	20 U	20 U
Phenanthrene	5 U	5 U
Anthracene	5 U	5 U
Di-n-butylphthalate	5 U	5 U
Fluoranthene	5 U	5 U
Pyrene	5 U	5 U
Butylbenzylphthalate	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U
Benzo(a)anthracene	5 U	5 U
Chrysene	5 U	5 U
bis(2-Ethylhexyl)phthalate	1 J	2 J
Di-n-octylphthalate	5 U	5 U
Benzo(b)Fluoranthene	5 U	5 U
Benzo(k)Fluoranthene	5 U	5 U
Benzo(a)Pyrene	5 U	5 U
Indeno(1,2,3-cd)Pyrene	5 U	5 U
Dibenzo(a,h)Anthracene	5 U	5 U
Benzo(g,h,i)Perylene	5 U	5 U
Total Number of TICs *	1	2

* Number, not concentration, of tentatively identified compounds (TICs).

Table C-2\Alco\data\rw-svol.wk4 + bu disk

Table C-2 (Continued) Semivolatile Organic Analysis for Drinking Water Well Samples Tentatively Identified Compounds Alco Springs Industries Site Concentrations in ug/L		
Compound Name	Retention Time	Estimated Concentration
Sample RW01		
Sulfur, Mol. (S8)	20.18	19 J
Sample RW01 Duplicate		
Sulfur, Mol. (S8)	20.19	14 J
Phosphine Oxide, Triphenyl	25.19	8 J

Table C-17\Alco\dataGW-SVTIC.WK4

Table C-3 Pesticide/PCB Analysis for Drinking Water Well Sample Alco Springs Industries Site		
Pesticide/PCB	Sample Locations and Number Concentrations in µg/L	
	RW01	RW01 (Duplicate)
Alpha-BHC	0.01 U	0.01 U
Lindane	0.01 U	0.01 U
Heptachlor	0.01 U	0.01 U
Aldrin	0.01 U	0.01 U
Heptachlor Epoxide	0.01 U	0.01 U
Endosulfan I	0.01 U	0.01 U
Dieldrin	0.02 U	0.02 U
Endrin	0.02 U	0.02 U
Endosulfan II	0.02 U	0.02 U
p,p'-DDT	0.02 U	0.02 U
Methoxychlor	0.1 U	0.1 U
Beta-BHC	0.01 U	0.01 U
Delta-BHC	0.01 U	0.01 U
Gamma-Chlordane	0.01 U	0.01 U
Alpha-Chlordane	0.01 U	0.01 U
p,p'-DDE	0.02 U	0.02 U
p,p'-DDD	0.02 U	0.02 U
Endrin Aldehyde	0.02 U	0.02 U
Endolsulfan Sulfate	0.02 U	0.02 U
Endrin Ketone	0.02 U	0.02 U
Chlordane, Technical	0.2 U	0.2 U
Toxaphene	1 U	1 U
Aroclor 1221	0.2 U	0.2 U
Aroclor 1232	0.2 U	0.2 U
Aroclor 1242	0.2 U	0.2 U
Aroclor 1016	0.2 U	0.2 U
Aroclor 1248	0.2 U	0.2 U
Aroclor 1254	0.2 U	0.2 U
Aroclor 1260	0.2 U	0.2 U

Table C-3\Alco\data\rw-pest.wk4 + bu disk

Table C-4 Inorganic Analysis for Drinking Water Well Sample Alco Springs Industries Site		
Metals and Cyanide	Sample Locations and Number Concentrations in ug/L	
	RW01	RW01 (Duplicate)
Aluminum	80 U	80 U
Antimony	2 U	2 U
Arsenic	2 U	2 U
Barium	93	95
Beryllium	2 U	2 U
Cadmium	0.2 U	0.2 U
Calcium	141000	143000
Chromium	10 U	10 U
Cobalt	6 U	6 U
Copper	6 U	6 U
Iron	4000	4230
Lead	2 U	2 U
Magnesium	79000	80000
Manganese	42	44
Mercury	0.1 U	0.1 U
Nickel	20 U	20 U
Potassium	5000 U	5000 U
Selenium	4	2
Silver	6 U	6 U
Sodium	32000	33000
Thallium	2 U	2 U
Vanadium	8 U	8 U
Zinc	40 U	40 U
Cyanide	5 U	5 U

Table C-4\Alco\data\rw-metal.wk4 + bu disk

Table C-5
Volatile Organic Analysis for Groundwater Samples
Alco Springs Industries Site

Volatile Compound	Sample Locations and Number Concentrations in µg/L		
	GW01	GW01 (Duplicate)	GW02
Chloromethane	10 UJ	10 UJ	10 UJ
Bromomethane	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Methylene Chloride	10 UJB	10 UJB	10 UJB
Acetone	10 U	10 U	10 U
Carbon Disulfide	2 J	2 J	10 U
1,1-Dichloroethene	10 U	10 U	10 UJ
1,1-Dichloroethane	10 U	10 U	10 U
1,2-Dichloroethene (total)	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U
Benzene	10 U	10 U	10 U
Trans-1,3-Dichloropropene	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U
4-Methyl-2-Pentanone	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U
Toluene	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U
Styrene	10 U	10 U	10 U
Xylene (total)	10 U	10 U	10 U
Total Number of TICS *	0	0	0

* Number, not concentrations, of tentatively identified compounds (TICs).

Table C-5\Alco\datagw-volat.wk4 + bu disk

Table C-6 Semivolatile Organic Analysis for Groundwater Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number Concentrations in µg/L		
	GW01	GW01 (Duplicate)	GW02
Phenol	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U
4-Chloroaniline	10 UJ	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U
4-Chloro-3-Methylphenol	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U
2,4,5-Trichlorophenol	25 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U
Acenaphthylene	10 U	25 U	25 U
2,6-Dinitrotoluene	10 U	10 U	10 U
3-Nitroaniline	25 U	10 U	10 U
Acenaphthene	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U
Dibenzofuran	10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U
N-Nitrosodiphenylamine	10 U	10 U	10 U

Table C-6 (Continued) Semivolatile Organic Analysis for Groundwater Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number Concentrations in µg/L		
	GW01	GW01 (Duplicate)	GW02
4-Bromophenyl-phenylether	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U
Phenanthrene	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U
di-n-butylphthalate	1 J	10 U	10 U
Fluoranthene	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U
Di-n-octylphthalate	10 UJ	10 U	10 U
Benzo(b)fluoranthene	10 UJ	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 UJ	10 U	10 U
Total Number of TICs *	1	2	1

* Number, not concentration, of tentatively identified compounds (TICs).

Table C-6\Alco\data\gw-svol.wbt + bu disk

Table C-6 (Continued) Semivolatile Organic Analysis for Groundwater Samples Tentatively Identified Compounds Alco Springs Industries Site Concentrations in ug/L		
Compound Name	Retention Time	Estimated Concentration
Sample GW01		
Unknown	12.84	2 J
Sample GW01 (Duplicate)		
Substituted Alcohol	7.30	2 J
Unknown	12.89	4 J
GW02		
Substituted Alcohol	7.30	3 J

Table C-18\Alco\data\GW-VTIC.WK4

Table C-7 Pesticide/PCB Analysis for Groundwater Samples Alco Springs Industries Site			
Pesticide/PCB	Sample Locations and Number Concentrations in µg/L		
	GW01	GW01 (Duplicate)	GW02
Alpha-BHC	0.050 U	0.050 U	0.050 U
Beta-BHC	0.050 U	0.050 U	0.050 U
Delta-BHC	0.050 U	0.050 U	0.050 U
Gamma-BHC (Lindane)	0.0021 JP	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.1040 JP	0.0048 JP
4,4'-DDT	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U
Alpha-Chlordane	0.050 U	0.050 U	0.050 U
Gamma-Chlordane	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U	1.0 U

Table C-7\alco\gw-pest.wk4 + bu disk

Table C-8 Inorganic Analysis for Groundwater Samples Alco Springs Industries Site			
Metals and Cyanide	Sample Locations and Number Concentrations in ug/L		
	GW01	GW01 (Duplicate)	GW02
Aluminum	325 J	169 JB	47.3 JB
Antimony	9.9 BJ	4.6 JB	3.7 JB
Arsenic	3.5 U	4.8 B	3.5 U
Barium	45.9 B	53.4 B	15.6 B
Beryllium	0.10 U	0.10 U	0.10 U
Cadmium	0.50 U	0.50 U	0.50 U
Calcium	293000 JE	341000 JE	342000 JE
Chromium	2.2 U	2.2 U	2.2 U
Cobalt	1.4 BJ	1.9 B	22.0 B
Copper	2.7 BJ	0.80 U	1.3 JB
Iron	10600	12700	1720
Lead	6.9 J	1.6 U	2.6 JB
Magnesium	148000	175000	151000
Manganese	199	236	331
Mercury	0.20 U	0.20 U	0.20 U
Nickel	9.1 B	12.2 B	22.9 B
Potassium	8770 JE	10200 JE	7590 JE
Selenium	4.4 U	4.4 U	4.4 U
Silver	0.60 U	0.60 U	0.60 U
Sodium	23300	27200	36200
Thallium	5.5 U	5.5 U	5.5 U
Vanadium	0.50 U	0.50 U	0.50 U
Zinc	81.8	69.4	11.4 JB
Cyanide	10.0 U	10.0 U	10.0 U

Table C-8\A\Alco\data\gw-metal.wk4

Table C-9
Volatile Organic Analysis for Sediment Samples
Alco Springs Industries Site

Volatile Compound	Sample Locations and Number Concentrations in ug/kg		
	ST01	ST02	ST03
Chloromethane	14 U	16 U	15 U
Bromomethane	14 U	16 U	15 U
Vinyl Chloride	14 U	16 U	15 U
Chloroethane	14 U	16 U	15 U
Methylene Chloride	14 U	16 U	15 U
Acetone	14 UJ	16 UJ	15 U
Carbon Disulfide	14 U	16 U	15 U
1,1-Dichloroethene	14 U	16 U	15 U
1,1-Dichloroethane	14 U	16 U	15 U
1,2-Dichloroethene (total)	14 U	16 U	15 U
Chloroform	14 U	16 U	15 U
1,2-Dichloroethane	14 U	16 U	15 U
2-Butanone	14 UJ	16 UJ	15 U
1,1,1-Trichloroethane	14 U	16 U	15 U
Carbon Tetrachloride	14 U	16 U	15 U
Bromodichloromethane	14 U	16 U	15 U
1,2-Dichloropropane	14 U	16 U	15 U
cis-1,3-Dichloropropene	14 U	16 U	15 U
Trichloroethene	14 U	16 U	15 U
Dibromochloromethane	14 U	16 U	15 U
1,1,2-Trichloroethane	14 U	16 U	15 U
Benzene	14 U	16 U	15 U
trans-1,3-Dichloropropene	14 U	16 U	15 U
Bromoform	14 UJ	16 U	15 U
4-Methyl-2-Pentanone	14 UJ	16 UJ	15 U
2-Hexanone	14 UJ	16 UJ	15 U
Tetrachloroethene	14 U	16 U	15 U
1,1,2,2-Tetrachloroethane	14 U	16 U	15 U
Toluene	14 UJ	16 U	15 U
Chlorobenzene	14 U	16 U	15 U
Ethylbenzene	14 U	16 U	15 U
Styrene	14 U	16 U	15 U
Xylene (total)	14 U	16 U	15 U
Total Number of TICS *	0	0	0

* Number, not concentrations, of tentatively identified compounds (TICs). Table C-9\Alco\data\sed-vol.wk4

Table C-10 Semivolatile Organic Analysis for Sediment Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number / Concentrations in µg/kg		
	ST01	ST02	ST03
Phenol	450 U	520 U	490 U
bis(2-Chloroethyl)Ether	450 U	520 U	490 U
2-Chlorophenol	450 U	520 U	490 U
1,3-Dichlorobenzene	450 U	520 U	490 U
1,4-Dichlorobenzene	450 U	520 U	490 U
1,2-Dichlorobenzene	450 U	520 U	490 U
2-Methylphenol	450 U	520 U	490 U
2,2'-oxybis(1-Chloropropane)	450 U	520 U	490 U
4-Methylphenol	450 U	520 U	490 U
N-Nitroso-di-N-propylamine	450 U	520 U	490 U
Hexachloroethane	450 U	520 U	490 U
Nitrobenzene	450 U	520 U	490 U
Isophorone	450 U	520 U	490 U
2-Nitrophenol	450 U	520 U	490 U
2,4-Dimethylphenol	450 U	520 U	490 U
bis(2-Chloroethoxy)Methane	450 U	520 U	490 U
2,4-Dichlorophenol	450 U	520 U	490 U
1,2,4-Trichlorobenzene	450 U	520 U	490 U
Naphthalene	450 U	110 J	490 U
4-Chloroaniline	450 U	520 U	490 U
Hexachlorobutadiene	450 U	520 U	490 U
4-Chloro-3-Methylphenol	450 U	520 U	490 U
2-Methylnaphthalene	450 U	82 J	490 U
Hexachlorocyclopentadiene	450 U	520 U	490 U
2,4,6-Trichlorophenol	450 U	520 U	490 U
2,4,5-Trichlorophenol	1100 U	1300 U	1200 U
2-Chloronaphthalene	450 U	520 U	490 U
2-Nitroaniline	1100 U	1300 U	1200 U
Dimethyl Phthalate	450 U	520 U	490 U
Acenaphthylene	450 U	160 J	490 U
2,6-Dinitrotoluene	450 U	520 U	490 U
3-Nitroaniline	1100 U	1300 U	1200 U
Acenaphthene	450 U	260 J	490 U
2,4-Dinitrophenol	1100 U	1300 U	1200 U
4-Nitrophenol	1100 U	1300 U	1200 U
Dibenzofuran	450 U	81 J	490 U
2,4-Dinitrotoluene	450 U	520 U	490 U
Diethylphthalate	450 U	520 U	490 U
4-Chlorophenyl-Phenylether	450 U	520 U	490 U
Fluorene	450 U	410 J	490 U
4-Nitroaniline	1100 U	1300 U	1200 U
4,6-Dinitro-2-Methylphenol	1100 U	1300 U	1200 U
N-Nitrosodiphenylamine	450 U	520 U	490 U

Table C-10 (Continued) Semivolatile Organic Analysis for Sediment Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number / Concentrations in µg/kg		
	ST01	ST02	ST03
4-Bromophenyl-Phenylether	450 U	520 U	490 U
Hexachlorobenzene	450 U	520 U	490 U
Pentachlorophenol	1100 U	1300 U	1200 U
Phenanthrene	150 J	1200	490 U
Anthracene	450 U	510 J	490 U
Carbazole	450 U	520 U	490 U
Di-n-Butylphthalate	450 U	520 UJB	490 UJB
Fluoranthene	270 J	1600	490 U
Pyrene	220 J	4600 J	490 U
Butylbenzylphthalate	450 U	520 UJ	490 U
3,3'-Dichlorobenzidine	450 U	520 UJ	490 U
Benzo(a)anthracene	89 J	2500 J	490 U
Chrysene	100 J	2900 J	490 U
bis(2-Ethylhexyl)Phthalate	450 UJB	510 UJB	490 UJB
Di-n-Octyl Phthalate	450 U	80 J	490 U
Benzo(b)fluoranthene	91 J	2100 J	490 U
Benzo(k)fluoranthene	120 J	2000 J	490 U
Benzo(a)pyrene	93 J	2400 J	490 U
Indeno(1,2,3-cd)pyrene	450 U	1600 J	490 U
Dibenzo(a,h)anthracene	450 U	520 UJ	490 U
Benzo(g,h,i)perylene	450 U	1700 J	490 U
Total Number of TICs*	11	6	7

* Number, not concentrations, of tentatively identified compounds (TICs).

Table C-10\Alco\data\sed-svol.wk4 + bu dsk

Table C-10 (Continued)
Semivolatile Organic Analysis for Sediment Samples
Tentatively Identified Compounds
Alco Springs Industries Site
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
Sample ST01 (Background)		
Unknown PAH	29.64	550 J
Unknown	27.45	400 J
Unknown Alcohol	38.12	390 J
Unknown Carboxylic Acid	22.90	380 JB
Unknown	34.37	330 J
Unknown	32.21	310 J
Unknown Amine	28.02	220 J
Unknown Alcohol	4.15	200 J
Unknown Ketone	27.94	120 J
Unknown Acid	27.89	120 J
Unknown Ketone	23.00	110 J
Sample ST02		
Aldol Condensation Product	6.36	16000 JABU
Unknown	5.76	2000 JBU
Unknown Alkene	17.37	1000 J
Unknown	7.92	780 JB
Unknown Alkene	13.65	580 J
Unknown Alkene	13.85	470 J
Unknown PAH	13.74	380 J
Unknown	13.47	240 J
Sample ST03		
Unknown Alcohol	38.12	2100 J
Unknown PAH	29.64	1300 J
Unknown Ketone	28.97	970 J
Unknown	34.35	830 J
Unknown Carboxylic Acid	22.90	540 JB
Unknown Alcohol	18.86	330 J
Unknown Alkene	27.36	220 J

Table C-19\Alco\data\sed-tic.wk4

Table C-11
Pesticide/PCB Analysis for Sediment Samples
Alco Springs Industries Site

Pesticide/PCB	Sample Location and Number / Concentrations in µg/kg		
	ST01	ST02	ST03
Alpha-BHC	2.3 U	2.7 U	2.5 U
Beta-BHC	2.3 U	2.7 U	2.5 U
Delta-BHC	2.3 U	2.7 U	2.5 U
Gamma-BHC (Lindane)	2.3 U	2.7 U	2.5 U
Heptachlor	2.3 U	2.7 U	2.5 U
Aldrin	2.3 U	2.7 U	2.5 U
Heptachlor Epoxide	2.3 U	2.7 U	2.5 U
Endosulfan I	2.3 U	2.7 U	2.5 U
Dieldrin	4.4 U	3.4 JP	4.8 U
4,4'-DDE	3.0 J	5.2 U	4.8 U
Endrin	4.4 U	5.2 U	4.8 U
Endosulfan II	4.4 U	5.2 U	4.8 U
4,4'-DDD	5.1 P	30 P	4.8 U
Endosulfan Sulfate	4.4 U	7.2 P	4.8 U
4,4'-DDT	3.4 JP	5.2 U	4.8 U
Methoxychlor	23 U	40 P	25 U
Endrin Ketone	4.4 U	25 P	4.8 U
Endrin Aldehyde	4.4 U	5.2 U	4.8 U
Alpha-Chlordane	1.3 JP	4.7 P	2.5 U
Gamma-Chlordane	2.3 U	2.7 U	2.5 U
Toxaphene	230 U	270 U	250 U
Aroclor-1016	44 U	52 U	48 U
Aroclor-1221	90 U	110 U	98 U
Aroclor-1232	44 U	52 U	48 U
Aroclor-1242	44 U	52 U	48 U
Aroclor-1248	24 J	52 U	48 U
Aroclor-1254	44 U	170	48 U
Aroclor-1260	44 U	52 U	48 U

Table C-11\Alco\data\sed-pest.wk4 + bu disks

Table C-12 Inorganic Analysis for Sediment Samples Alco Springs Industries Site			
Metals and Cyanide	Sample Location and Number Concentrations in mg/kg		
	ST01	ST02	ST03
Aluminum	4620	5840	11200
Antimony	1.3 U	1.9 B	1.5 U
Arsenic	4.8 J	17.4	6.8 J
Barium	30.0 B	89.7	60.3 B
Beryllium	0.42 B	0.84 B	0.83 B
Cadmium	0.25 U	0.29 U	0.30 U
Calcium	12000	76100	49300
Chromium	12.0	23	21.2
Cobalt	8.4 B	7.4 B	11.2 B
Copper	21.9	303	34.3
Iron	11200	32000	20900
Lead	23.0	77.6	38
Magnesium	7380	7390	17900
Manganese	155	487	408
Mercury	0.13 U	0.14 U	0.15 U
Nickel	17.6	18.1	26.4
Potassium	1010 B	1610	2880
Selenium	0.76 U	0.87 U	1.5 J
Silver	0.76 U	0.87 U	0.91 U
Sodium	252 JBE	390 JBE	302 JBE
Thallium	2.3 U	2.6 U	2.7 U
Vanadium	13.4	15.1	23.9
Zinc	57.5	201	110
Cyanide	1.3 U	1.4 U	1.5 U

Table C-12\Alco\data\sedmetal.wk4 + bu disk

Table C-13
Volatile Organic Analysis for Soil Samples
Alco Springs Industries Site

Volatile Compound	Sample Locations and Number / Concentration in µg/kg		
	SS01	SS02	SS03
Chloromethane	12 UJ	12 UJ	12 UJ
Bromomethane	12 U	12 U	12 U
Vinyl Chloride	12 U	12 U	12 U
Chloroethane	12 U	12 U	12 U
Methylene Chloride	19 UJB	28 UJB	15 UJB
Acetone	13 UJB	36 UJB	12 UJB
Carbon Disulfide	12 U	12 U	12 U
1,1-Dichloroethene	12 U	12 U	12 U
1,1-Dichloroethane	12 U	12 U	12 U
1,2-Dichloroethene (total)	12 U	12 U	12 U
Chloroform	12 U	12 U	12 U
1,2-Dichloroethane	12 U	12 U	12 U
2-Butanone	12 U	12 U	12 U
1,1,1-Trichloroethane	12 U	12 U	12 U
Carbon Tetrachloride	12 U	12 U	12 U
Bromodichloromethane	12 U	12 U	12 U
1,2-Dichloropropane	12 U	12 U	12 U
cis-1,3-Dichloropropene	12 U	12 U	12 U
Trichloroethene	12 U	12 U	12 U
Dibromochloromethane	12 U	12 U	12 U
1,1,2-Trichloroethane	12 U	12 U	12 U
Benzene	12 U	12 U	12 U
trans-1,3-Dichloropropene	12 U	12 U	12 U
Bromoform	12 U	12 U	12 U
4-Methyl-2-Pentanone	12 U	12 U	12 U
2-Hexanone	12 U	12 U	12 U
Tetrachloroethene	12 U	12 U	12 U
1,1,2,2-Tetrachloroethane	12 U	12 U	12 U
Toluene	12 U	12 U	12 U
Chlorobenzene	12 U	12 U	12 U
Ethylbenzene	12 U	12 U	12 U
Styrene	12 U	12 U	12 U
Xylene (total)	12 U	12 U	12 U
Total Number of TICS *	0	0	0

* Number, not concentrations, of tentatively identified compounds (TICs).

Table C-13\Alco\data\soil-vol.wk4

Table C-14 Semivolatile Organic Analysis for Soil Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number / Concentrations in µg/kg		
	SS01	SS02	SS03
Phenol	410 U	49 J	400 U
bis(2-Chloroethyl)ether	410 U	400 U	400 U
2-Chlorophenol	410 U	400 U	400 U
1,3-Dichlorobenzene	410 U	400 U	400 U
1,4-Dichlorobenzene	410 U	400 U	400 U
1,2-Dichlorobenzene	410 U	400 U	400 U
2-Methylphenol	410 U	400 U	400 U
2,2'-oxybis(1-Chloropropane)	410 U	400 U	400 U
4-Methylphenol	410 U	400 U	400 U
N-Nitroso-di-n-propylamine	410 U	400 U	400 U
Hexachloroethane	410 U	400 U	400 U
Nitrobenzene	410 U	400 U	400 U
Isophorone	410 U	400 U	400 U
2-Nitrophenol	410 U	400 U	400 U
2,4-Dimethylphenol	410 U	400 U	400 U
bis(2-Chloroethoxy)methane	410 U	400 U	400 U
2,4-Dichlorophenol	410 U	400 U	400 U
1,2,4-Trichlorobenzene	410 U	400 U	400 U
Naphthalene	410 U	120 J	84 J
4-Chloroaniline	410 UJ	400 UJ	400 UJ
Hexachlorobutadiene	410 U	400 U	400 U
4-Chloro-3-methylphenol	410 U	400 U	400 U
2-Methylnaphthalene	410 U	94 J	220 J
Hexachlorocyclopentadiene	410 U	400 U	400 U
2,4,6-Trichlorophenol	410 U	400 U	400 U
2,4,5-Trichlorophenol	1000 U	1000 U	1000 U
2-Chloronaphthalene	410 U	400 U	400 U
2-Nitroaniline	1000 U	1000 UJ	1000 U
Dimethylphthalate	410 U	400 U	400 U
Acenaphthylene	410 U	340 J	400 U
2,6-Dinitrotoluene	410 U	400 U	400 U
3-Nitroaniline	1000 U	1000 U	1000 U
Acenaphthene	410 U	190 J	400 U
2,4-Dinitrophenol	1000 UJ	1000 UJ	100 UJ
4-Nitrophenol	1000 U	1000 UJ	1000 U
Dibenzofuran	410 U	180 J	64 J
2,4-Dinitrotoluene	410 U	400 U	400 U
Diethylphthalate	410 U	400 U	400 U
4-Chlorophenyl-phenylether	410 U	400 U	400 U
Fluorene	410 U	590	400 U
4-Nitroaniline	1000 U	1000 U	1000 U
4,6-Dinitro-2-methylphenol	1000 U	1000 U	1000 U
n-Nitrosodiphenylamine	410 UJ	400 UJ	400 UJ

Table C-14 (Continued) Semivolatile Organic Analysis for Soil Samples Alco Springs Industries Site			
Semivolatile Compound	Sample Location and Number / Concentrations in µg/kg		
	SS01	SS02	SS03
4-Bromophenyl-phenylether	410 U	400 U	400 U
Hexachlorobenzene	410 U	400 UJ	400 U
Pentachlorophenol	1000 UJ	1000 UJ	1000 UJ
Phenanthrene	65 J	3000 D	340 J
Anthracene	410 U	1000	52 J
Carbazole	410 U	200 J	400 U
di-n-butylphthalate	76 J	54 J	51 J
Fluoranthene	100 J	5200 D	280 J
Pyrene	96 J	7100 D	800
Butylbenzylphthalate	410 U	400 UJ	400 U
3,3'-Dichlorobenzidine	410 UJ	400 UJ	400 UJ
Benzo(a)anthracene	61 J	5000 D	240 J
Chrysene	78 J	4000 D	320 J
bis(2-Ethylhexyl)phthalate	410 UJB	140 J	470 UB
di-n-Octylphthalate	410 U	400 UJ	400 UJ
Benzo(b)fluoranthene	110 JX	6400 DX	520 XJ
Benzo(k)fluoranthene	110 JX	6000 DX	470 XJ
Benzo(a)pyrene	54 J	4000 D	250 J
Indeno(1,2,3-cd)pyrene	410 U	2400	260 J
Dibenzo(a,h)anthracene	410 U	590	400 UJ
Benzo(g,h,i)perylene	410 U	2400	1000 J
Total Number of TICs*	15	29	23

* Number, not concentrations, of tentatively identified compounds (TICs).

Table C-14\Alco\data\soil-sv.wk4 + bu disk

Table C-14 (Continued)
Semivolatile Organic Analysis for Soil Samples
Tentatively Identified Compounds
Alco Springs Industries Site
Concentrations in µg/kg

Compound Name	Retention Time	Estimated Concentration
Sample SS01		
Aldol (BC)	4.44	59375 AJB
Unknown	7.47	132 J
Unknown	15.28	585 J
Unknown	15.82	140 J
Unknown	16.29	499 J
Unknown	16.82	105 J
Unknown	17.18	93 J
Benzopyrene	17.92	109 J
Unknown	18.48	103 J
Unknown	19.66	557 J
Unknown	22.96	234 J
Unknown	22.99	166 J
Unknown	23.02	189 J
Unknown	23.06	142 J
Unknown	23.11	98 J
Sample SS02		
Methylphenanthrene	13.65	1010 J
Unknown PAH	13.77	2298 J
Unknown	14.43	1013 J
Benzonapthofuran	14.89	1413 J
Methylpyrene	15.20	1257 J
Benzofluorene	15.36	2512 J
Benzofluorene	15.45	1511 J
Methylpyrene	15.52	1473 J
Methylpyrene	15.65	808 J
Methylpyrene	15.69	834 J
Unknown	15.79	1001 J
Benzanthracenone	16.12	1575 J
Benzonaphthothiophene	16.32	2774 J
Unknown PAH	16.36	1898 J
Unknown PAH	16.42	1747 J
Benzntharcenone	16.47	1967 J
Benzonaphthothiophene	16.62	1140 J
Unknown PAH	16.99	1104 J
Unknown	17.07	1027 J
Unknown	17.22	1246 J
Unknown PAH	17.58	3081 J
Unknown PAH	17.66	1453 J
Unknown	17.90	1168 J
Unknown	17.95	1448 J
Unknown	18.06	1249 J
Benzofluoranthene	19.61	1368 J
Benzopyrene	20.17	4068 J
Benzofluoranthene	20.62	1855 J
Unknown	23.48	3079 J

Table C-14 (Continued) Semivolatile Organic Analysis for Soil Samples Tentatively Identified Compounds Alco Springs Industries Site Concentrations in µg/kg		
Compound Name	Retention Time	Estimated Concentration
Sample SS03		
Unknown	5.03	232 J
Dimethylnaphthalene	9.38	235 J
Dimethylnaphthalene	9.47	356 J
Unknown	11.40	315 J
Unknown	12.05	351 J
Methylphenanthrene	12.57	268 J
Methylanthracene	12.60	252 J
Unknown	12.96	311 J
Anthracenedione	12.99	267 J
Unknown	13.65	300 J
Unknown	14.33	778 J
Methylpyrene	14.42	656 J
Methylpyrene	14.54	695 J
Methylpyrene	14.58	521 J
Unknown	14.91	459 J
Unknown	15.71	724 J
Unknown	15.86	1961 J
Unknown	16.03	793 J
Unknown	16.34	682 J
Unknown	16.43	598 J
Unknown	16.54	903 J
Unknown	16.75	709 J
Unknown	18.78	701 J

Table C-20\Alco\data\svtic-ss.wk4

Table C-15
Pesticide/PCB Analysis for Soil Samples
Alco Springs Industries Site

Pesticide/PCB	Sample Location and Number / Concentrations in µg/kg		
	SS01	SS02	SS03
Alpha-BHC	2.1 U	2.1 U	2.1 UJ
Beta-BHC	2.1 U	2.1 U	2.1 UJ
Delta-BHC	2.1 U	2.1 U	2.1 UJ
Gamma-BHC (Lindane)	2.1 U	2.1 U	2.1 UJ
Heptachlor	2.1 U	2.1 U	2.1 UJ
Aldrin	0.38 J	2.1 U	8.1 JP
Heptachlor Epoxide	2.1 U	2.1 U	2.3 JP
Endosulfan I	2.1 U	2.1 U	2.3 J
Dieldrin	4.1 U	4.0 U	4.0 UJ
4,4'-DDE	2.8 JP	7.4 P	4.0 UJ
Endrin	0.67 JP	4.0 U	4.0 UJ
Endosulfan II	4.1 U	4.0 U	4.0 UJ
4,4'-DDD	1.8 JP	4.0 U	23 JP
Endosulfan Sulfate	4.1 U	4.0 U	4.0 UJ
4,4'-DDT	4.8 P	4.6 P	46 JD
Methoxychlor	21 U	21 P	5.7 JP
Endrin Ketone	4.1 U	4.0 U	4.0 UJ
Endrin Aldehyde	4.1 U	4.0 U	3.6 JP
Alpha-Chlordane	2.1 U	2.1 U	3.3 JP
Gamma-Chlordane	2.1 U	2.1 U	6.1 J
Toxaphene	210 U	210 U	210 UJ
Aroclor-1016	41 U	40 U	40 UJ
Aroclor-1221	83 U	82 U	82 UJ
Aroclor-1232	41 U	40 U	40 UJ
Aroclor-1242	41 U	40 U	40 UJ
Aroclor-1248	41 U	40 U	40 UJ
Aroclor-1254	41 U	40 U	40 UJ
Aroclor-1260	41 U	40 U	40 UJ

Table C-15\Alco\Data\soilpest.wk4 + bu disk

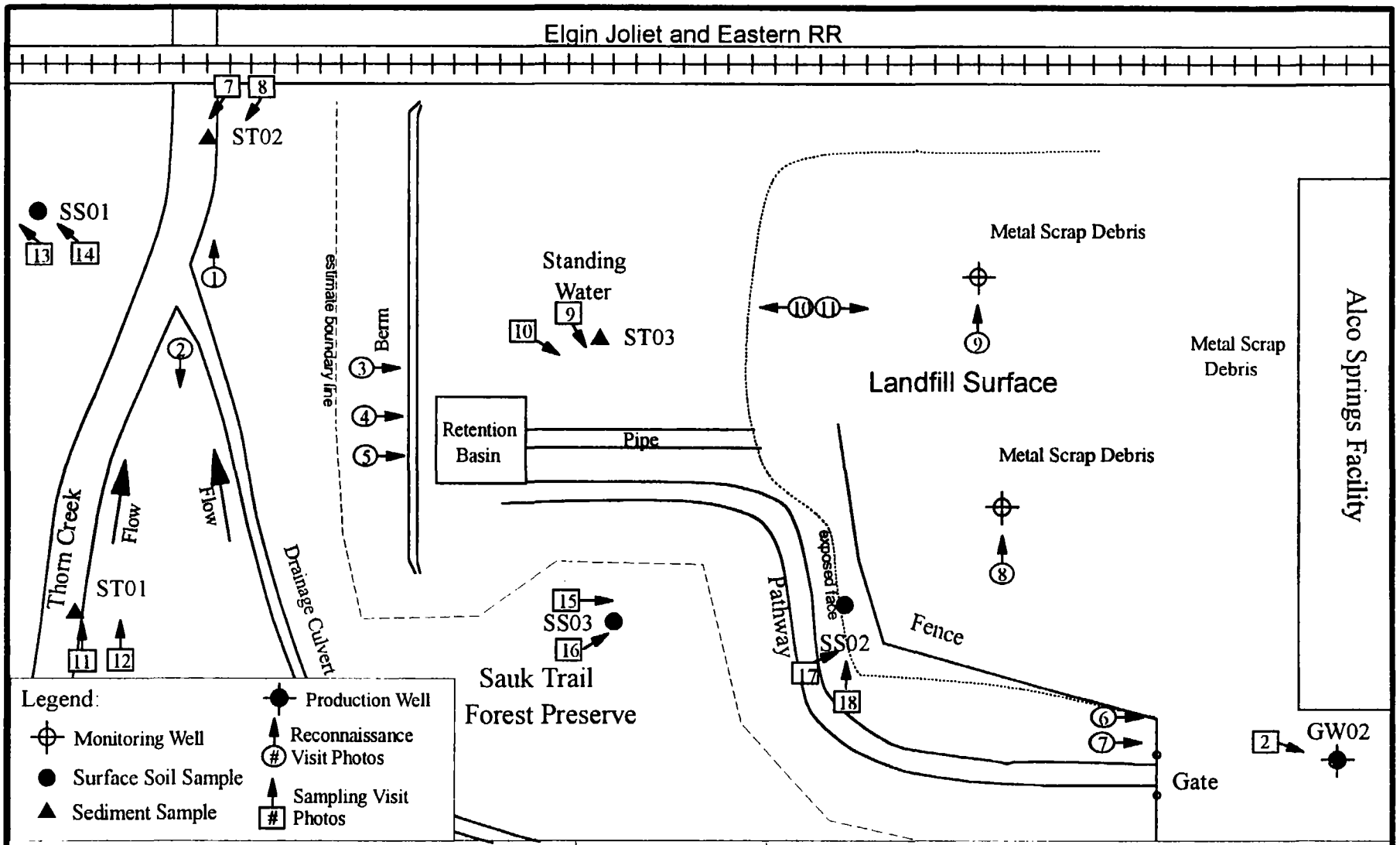
Table C-16 Inorganic Analysis for Soil Samples Alco Springs Industries Site			
Metals and Cyanide	Sample Location and Number Concentrations in mg/kg		
	SS01	SS02	SS03
Aluminum	3720	3700	2070
Antimony	0.47 UJN	0.56 JNB	1.1 JNB
Arsenic	4.3	2.9	5.1
Barium	38.3 B	29.8 B	32.0 B
Beryllium	0.26 B	0.20 B	0.19 B
Cadmium	0.30 B	0.39 B	1.7
Calcium	13200	40400	104000
Chromium	10.8	183	79.4
Cobalt	6.4 B	22.1	6.8 B
Copper	12.8 JE	38.5 JE	102 JE
Iron	9860	24500	53100
Lead	33.6	30.4	51.1
Magnesium	7710	42200	71700
Manganese	309	1080	546
Mercury	0.12 U	0.11 U	0.11 U
Nickel	11.8	366	45.9
Potassium	743 JBE	965 JBE	617 JBE
Selenium	1.2 B	1.1 U	0.96 U
Silver	0.15 UJN	0.15 UJN	0.13 UJN
Sodium	163 B	201 B	396 B
Thallium	1.4 U	1.3 U	1.2 U
Vanadium	8.0 B	7.0 B	0.11 U
Zinc	55.5	56.9	76.8
Cyanide	0.62 U	0.63 U	0.56 U

Table C-16\Alco\data\soil-met.wk4

Appendix D

Alco Springs Industries

Site Photographs



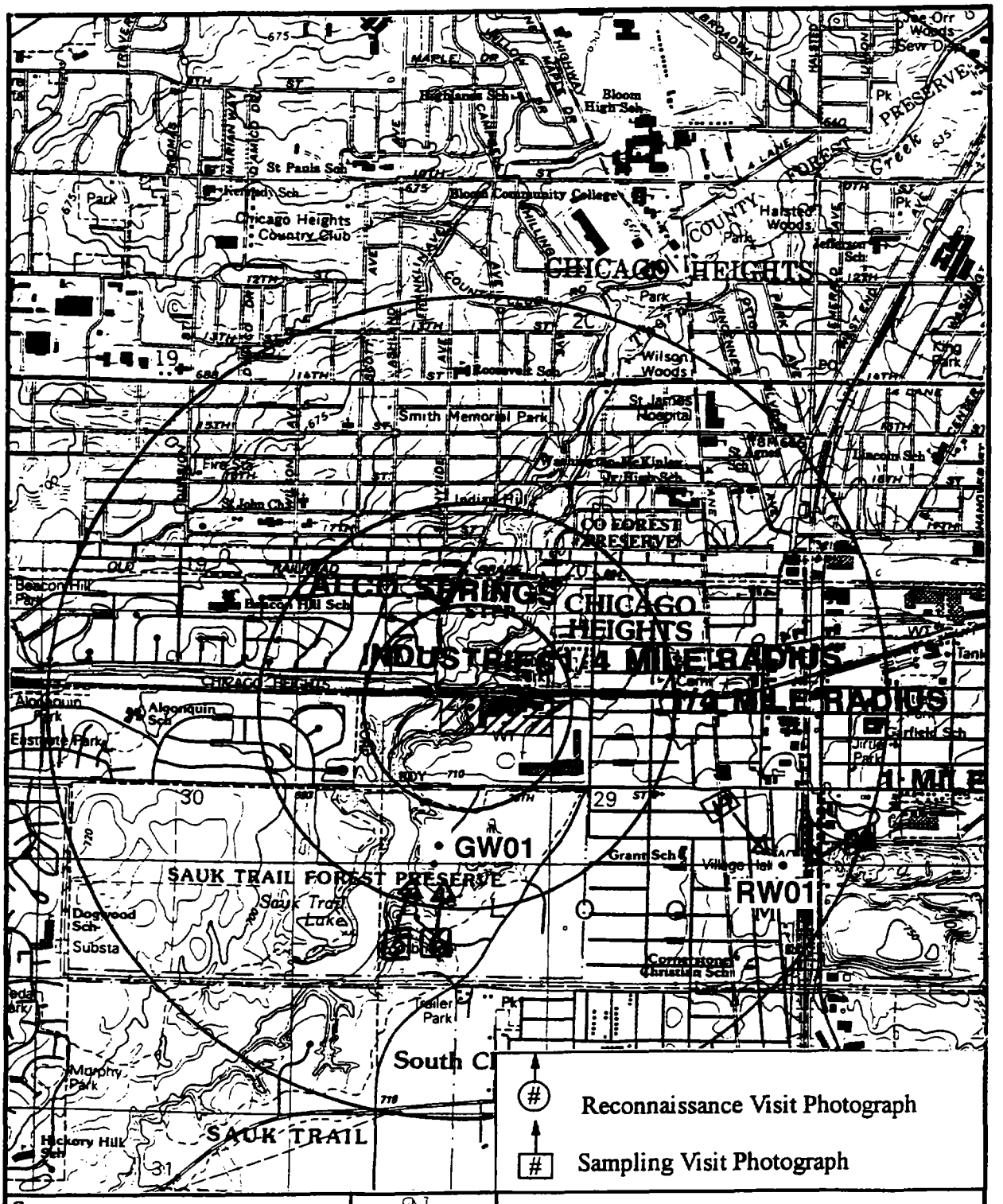
Source: 1995 Site Reconnaissance

Scale: Not To Scale

Figure D-1
Onsite Photo Location Map

Alco Springs Industries
Chicago Heights, Illinois

FRE00358.PRE
8.24.95



Source:
USGS 7.5 topographic maps
Steger 1990 and Harvey 1993

Scale:
1:24,000

N

Figure D-2
Offsite Photo Location Map

Alco Springs Industries
Chicago Heights, Illinois

Date: 02/07/95

Time: 1030

Photo Taken By: Oliver Graf

Photo Number: 1

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: View downstream of Thorn Creek.

Date: 02/07/95

Time: 1030

Photographer: Oliver Graf

Photo Number: 2

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: South

Description: Upstream view of Thorn Creek.

Date: 02/07/95

Time: 1040

Photo Taken By: Oliver Graf

Photo Number: 3

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: View of landfill face west of berm.

Date: 02/07/95

Time: 1040

Photographer: Oliver Graf

Photo Number: 4

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: View of landfill face west of berm.

Date: 02/07/95

Time: 1040

Photo Taken By: Oliver Graf

Photo Number: 5

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: View of landfill face west of berm.

Date: 02/07/95

Time: 1045

Photographer: Oliver Graf

Photo Number: 6

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: Exposed face of landfill where grease and oil were seen.

Date: 02/07/95

Time: 1045

Photo Taken By: Oliver Graf

Photo Number: 7

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: Exposed face of landfill where grease and oil were seen.

Date: 02/07/95

Time: 1050

Photographer: Oliver Graf

Photo Number: 8

Roll Number : 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Monitoring well flush mounted on south central end of fill.

Date: 02/07/95

Time: 1055

Photo Taken By: Oliver Graf

Photo Number: 9

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Monitoring well at north central end of landfill.

Date: 02/07/95

Time: 1056

Photographer: Oliver Graf

Photo Number: 10

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: West

Description: View from top of fill to marsh and creek.

Date: 02/07/95

Time: 1058

Photo Taken By: Oliver Graf

Photo Number: 11

Roll Number: 1 (site reconnaissance)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: View of landfill and rear of facility.

Date: 03/27/95

Time: 1000

Photo Taken By: Ramona Reints

Photo Number: 2

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: None noted.

Description: Closeup view of GW02 in well house (onsite production well).

Date: 03/27/95

Time: 1100

Photographer: Ramona Reints

Photo Number: 5

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Closeup view of GW01 from Forest Preserve pump well.

Date: 03/27/95

Time: 1100

Photo Taken By: Ramona Reints

Photo Number: 6

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Distant view of GW01 from Forest Preserve pump well.

Date: 03/28/95

Time: 0840

Photographer: Ramona Reints

Photo Number: 7

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: South/southwest

Description: Closeup view of ST02 in Thorn Creek, downstream of site.

Date: 03/28/95

Time: 0840

Photo Taken By: Ramona Reints

Photo Number: 8

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: South/southwest

Description: Far view of ST02 in Thorn Creek, downstream of site.

Date: 03/28/95

Time: 0900

Photographer: Ramona Reints

Photo Number: 9

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East/southeast

Description: Closeup view of standing water near ST03 in marsh area below landfill.

Date: 03/28/95

Time: 0900

Photo Taken By: Ramona Reints

Photo Number: 10

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East/southeast

Description: Far view of standing water near ST03 in marsh area below landfill.

Date: 03/28/95

Time: 0920

Photographer: Ramona Reints

Photo Number: 11

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Closeup view of ST01. East bank of Thorn Creek upstream of the site.

Date: 03/28/95

Time: 0920

Photo Taken By: Ramona Reints

Photo Number: 12

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Far view of ST01. Note flag from ST02 in far shot.

Date: 03/28/95

Time: 0940

Photographer: Ramona Reints

Photo Number: 13

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: West/northwest

Description: Closeup view of SS01 (background).

Date: 03/28/95

Time: 0940

Photo Taken By: Ramona Reints

Photo Number: 14

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: West/northwest

Description: Far view of SS01 (background).

Date: 03/28/95

Time: 1000

Photographer: Ramona Reints

Photo Number: 15

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: Closeup view of SS03.

Date: 03/28/95

Time: 1000

Photo Taken By: Ramona Reints

Photo Number: 16

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: Northeast

Description: Far view of SS03.

Date: 03/28/95

Time: 1015

Photographer: Ramona Reints

Photo Number: 17

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East/southeast

Description: Closeup view of SS02. Exposed face of landfill..

Date: 03/28/95

Time: 1015

Photo Taken By: Ramona Reints

Photo Number: 18

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: North

Description: Far view of SS02. Note concrete pipe in the background.

Date: 03/28/95

Time: 1305

Photographer: Ramona Reints

Photo Number: 19

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: None noted.

Description: Sampling point for South Chicago Heights municipal well located at 2729 Jackson Street.

Date: 03/28/95

Time: 1305

Photo Taken By: Ramona Reints

Photo Number: 20

Roll Number: 1 (sampling trip)

Location/ILD #: Alco Springs Industries/ILD048300412

Direction: East

Description: View of the landfill from RW01 well house.