Site Team Evaluation Prioritization

Allied Chemical Corp.
ILD 001833714
LPC 0316550004
Chicago, Cook County, IL
SF/HRS

APRIL 3, 1997

CERCLA Report

EPA Region 5 Records Ctr.
288531

Illinois Environmental Protection Agency

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SECTION I -- SITE BACKGROUND

1.1 INTRODUCTION

Allied Chemical Corporation was added to the Comprehensive Environmental Response, Compensation and Liability Act Inventory System (CERCLIS) on April 1, 1979 as a result of the company's filing of notice under Section 103c of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). A Preliminary Assessment was conducted September 1, 1984 by the Illinois EPA, a Site Inspection (without sampling) was conducted September 23, 1986 by a U.S.EPA contractor and a Site Inspection Prioritization (SIP) with limited sampling was performed by the Illinois EPA on March 28 & 29, 1995. The March 1995 SIP sampling event of the former Allied Chemical site was limited to the inactive portion of the site because site access to the active portion of the site was denied by the current owners.

Site Team Evaluation Prioritizations (STEPs) are conducted to determine current site conditions in order to update the status of outstanding Screening Site Inspections performed before the implementation of the revised Hazardous Ranking System. The STEPs examine and evaluate the threats posed by the site and provide sufficient information to decide the future course of action.

1.2 SITE DESCRIPTION

The Allied Chemical site is located at 12260 South Carondolet Avenue, in the City of Chicago (figure 1). It is located in Section 30 of Township 37 North, Range 15 East of the Third Principal Meridian. The site covers approximately 90 acres along the east side of the Calumet River just below Turning Basin #3 (figure 2).

The site is bound by the Calumet River and Turning Basin #3 to the northwest and north. To the east is South Carondolet Avenue and a large industrialized area. The southern boundary of the site is 126th street. Wolf Creek enters the site halfway along the southern property line. The creek flows northwesterly through the site and discharges into the Calumet River. A baseball field lies between 126th Street and Wolf Creek. Scattered houses directly south and west of Wolf Creek give way to a residential area approximately 700 feet southwest of the site. Arrow Terminals forms the west boundary (figures 3 - 5).

For the purposes of the CERCLA investigation, the Allied site property has been divided into the active and inactive portions. The active portion occupies approximately 30 acres in the northeast third of the site and was the subject of this STEP investigation. All manufacturing activities occurred within this area. The inactive portion occupies the remainder of the site. The inactive portion was utilized as the facility's manufacturing waste disposal area. Three landfills along with areas of discolored soil are found in the inactive portion of the site. Although the entire site required investigation, the CERCLA investigations were divided into two events. The first event in March 1995 focused on the inactive portion of the site. This report focuses on the active portion of the site.

1.3 SITE HISTORY

According to Division files the site was owned and operated from 1920 to 1981 by the Allied Chemical Corporation. The land was undeveloped prior to Allied Chemical. Allied Chemical

produced sulfuric acid, ammonium thiosulfate, aluminum chloride solution and reduced chromium sulfates, along with chemically pure acids for commercial use up to 1978. The active portion of the property was sold to Pressure Vessel Services Chemicals Inc.(PVS Chemical), in 1981. PVS Chemical currently produces many of the same products that Allied Chemical historically produced.

The inactive portion of the site was purchased in 1990 by the Anderson - Schroud Group, a real estate/ development company. It is in this area where the three Allied Chemical landfills are located. This area is currently undergoing redevelopment as an industrial complex and is an active participant in the Illinois EPA Site Remediation Program (figures 3 - 5).

1.4 REGULATORY STATUS

The PVS Corporation currently produces many of the same products as Allied Chemical produced and operates as a non-generator and non-handler of special waste and hazardous waste under the Resource Conservation Recovery Act (RCRA). Wastes are treated and neutralized on site prior to off site disposal. Numerous RCRA violations were recorded by the IEPA during Allied Chemical and later during PVS Chemical facility operations. According to IEPA Division files, acid spills and other chemicals have been discharged from the active facility into the Calumet River, spilled onto the ground and released to the air.

SECTION II -- SIP ACTIVITIES (March 1995)

2.1 PREVIOUS SITE ACTIVITIES

Site reconnaissance of the Allied Chemical property was conducted by members of the IEPA Site Assessment Unit on February 24, 1995. Site access onto the PVS owned properties for reconnaissance was denied during this visit. A limited visual reconnaissance of the PVS owned property was made from the inactive portion of the site. At the north end of the PVS property a pile of yellow material within 25 feet of the Calumet River was observed. To the south of the pile patches of a yellow material covered the ground (figure 3).

The site reconnaissance of the inactive portion of the site indicated areas of bright yellow soil discoloration, zones without vegetation, and areas of exposed lenses of yellow material up to 6 inches thick. A purple/maroonish material and a white crystalline material were found in pockets above the yellow lenses in two locations. Areas along the Calumet River riverwall have been eroded by the river. Where this has occurred lenses of the yellow and purple/maroonish materials were observed. A trench was excavated by the Anderson - Schroud contractors running east/west from South Carondolet Avenue into Wolf Creek intersecting landfill number one. Building debris along with the lenses of materials mentioned above were observed.

CERCLA Site Inspection Prioritization sampling activities on the inactive portion of the site were conducted by IEPA personnel on March 28 & 29, 1995. Six soil, eight sediment and two special waste samples were taken from various locations on the inactive portion of the site (figure 5). The two special waste samples were taken to identify any contaminants within the

specific lenses of material. The soil samples were taken to identify the extent of the contamination and to characterize the wastes. The sediment samples were taken to determine if any contaminants had migrated to an adjacent waterway. One landfill and one contaminated soil zone had inorganic contaminants (lead, chromium, etc.) that met or exceeded the soil/sediment CERCLA Superfund Chemical Data Matrix (SCDM) Removal Action Levels (RALs). Both of these areas are immediately south of the active portion of the site. The confluence of the Calumet River and Wolf Creek contained contaminants including semivolatiles (fluoranthene, pyrene, chrysene, etc.), PCBs (Aroclor-1254 and Aroclor-1260) that exceeded the soil/sediment background levels and inorganics (arsenic and lead) that exceeded the soil/sediment CERCLA benchmarks or RALs

Mr. Davidson from PVS Chemicals indicated that the legal council for PVS Chemical did not believe that the Illinois EPA's authority to conduct CERCLA activities applied to PVS Chemical and consequently access to collect environmental samples from the PVS Chemical owned portion of the site was denied during the field sampling activities of March 28 & 29, 1995.

SECTION III STEP SAMPLING ACTIVITIES (Aug. 1996)

3.1 INTERVIEWS

During the week of June 24, 1996, the IEPA contacted PVS Chemical in order to obtain permission to collect environmental samples from their facility. Mr. Brad Davidson of PVS Chemical, indicated that PVS Chemical had reconsidered their March 1995 position and would

cooperate with the IEPA during any CERCLA activities. He indicated that they would "split" samples with the IEPA, and a sample date of August 20 & 21, 1996 was established.

Mr. Dale Price of PVS met the IEPA sampling team on August 20, 1996 and briefed them on facility safety procedures and practices. Mr. Price accompanied the team throughout most of the site sampling activities.

3.2 STEP SAMPLING ACTIVITIES

The CERCLA STEP sampling event of the active portion of the site owned by PVS Chemical was conducted on August 20 and 21, 1996. Fourteen soil and four groundwater samples were collected from various locations on the active portion of the site. The soil samples were collected using stainless steel trowels that had been decontaminated prior to use, in accordance with IEPA guidelines. The soil samples were taken to characterize the waste and to identify the extent of contamination. The groundwater samples were taken to identify any migration of contaminants to the groundwater. Figures 3 - 5 identify site features and sample locations. Table 1 identifies and describes the samples. Appendix A contains the photographic documentation.

The soil samples were collected from a one to two inch layer of sandy silt on top of a slag layer ranging in depth from a few inches to more than five feet deep. All soil samples were collected as indicated by Table 1. Additional information for three of the samples is provided below.

Sample X102 was located in the northwest corner of the facility. The sample was collected in an

area covered with a yellow sulfur material. Mr. Price of PVS indicated that in 1987, a storage tank of approximately 125,000 gallon capacity containing sulfur had failed and spilled raw sulfur onto the ground and into the Calumet river. Remedial actions included dredging the Calumet River adjacent to the spill.

Sample X115 was located in the northeastern corner of the facility. The sample was collected in an area covered with a thin layer of white crystals. Mr. Price indicated that excess road salt may have been stored in this area.

Sample X106 was not collected. Several rail lines were recently removed from this area. The railroad fill and the underlying slag prevented any sample collection in the desired area.

3.3 SAMPLE RESULTS

"Key Samples" are analytical data obtained during the STEP investigation that indicate observed contamination and/or meet the Hazard Ranking System (HRS) definition of an observed release. Analysis of the on-site soils revealed the presence of PAHs including benzo(a)pyrene, PCBs, pesticides and inorganics including mercury, arsenic and chromium. Table 1 identifies and describes the samples. Tables 2 and 3 identify the key samples and their contaminants. Figures 6 and 7 locate key samples. Appendix B contains the Target Compound List and Appendix D (Volume II) contains the complete analytical results package. The analytical results were compared to the CERCLA Benchmarks and Removal Action Levels (RALs). The background

soil sample was collected from the WMW Powers Conservation Area. The sample contained low levels of Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), pesticides and inorganics. All the on-site soil samples were compared to the background soil sample. In addition to the contaminants listed above and in the tables, soil sample X102 had a pH of 1.4, which classifies it as a RCRA Characteristic hazardous waste. This is the location where a storage structure collapsed, spilling raw sulfur on the ground and into the Calumet River.

SECTION IV -- SITE SOURCES

4.1 SOURCE DEFINITION

During the previous CERCLA SIP investigation conducted on the inactive portion of the site in 1995, four sources were identified. They consisted of three old landfills and one area of contaminated soil (figure 8). The sources are believed to have held the various chemical wastes produced by Allied Chemical. Sludges containing heavy metals were allegedly used to cover the landfills. However, lenses of unknown materials were found in areas away from the actual landfills. It is possible that large areas of the inactive portion of the site were dump and fill zones. The inactive portion of the site is undergoing remediation with oversight provided by the Illinois EPA Site Remediation Program.

During the STEP investigation of June 1996 on the PVS Chemical portion of the site, two additional sources were identified (figure 8). The first source is the northwest corner of the site along the Calumet River and Turning Basin #3. The extent of the area is approximately one acre. This is where the storage tank collapsed, spilling raw sulfur onto the soil and into the Calumet

River. A pH value of 1.4 classifies the soil as a RCRA characteristic hazardous waste. PAHs and pesticides were present in the sample collected from this area.

The second source is the contaminated soil within the perimeter established by sample points: X105 to X115 to X113 to X109 to X107 and back to X105 (figure 8). This source area occupies approximately 15 acres or half the site. Contaminants include PAHs, pesticides and inorganics.

There are gates in the southern fence line that separate the active portion of the site from the inactive portion. One gate is immediately north of a contaminated soil area. There is a narrow bridge at the confluence of Wolf Creek and the Calumet River. This may have been utilized to transport the wastes to the area across from Wolf Creek.

SECTION V -- MIGRATION PATHWAYS

5.1 GROUNDWATER PATHWAY

According to the Cook County Soil Survey, the surficial soil present on-site is described as urban land. Urban land consists of built-up areas and deep, nearly level poorly drained soils that have a silty, loamy, clayey subsoil. The soils may be covered by pavement and buildings. This is evident by the cinders, slag, rock and other extraneous materials present at the surface on-site.

Information concerning the subsurface geology of the area has been taken from *Shallow Groundwater Quality and Hydrology of the Lake Calumet Area, Chicago, Illinois,* prepared by

George S. Roadcap and Walton R. Kelly of the Illinois State Water Survey. During the development of the Lake Calumet area, shallow lakes and wetlands were filled in with slag wastes, dredge wastes, open ash and cinders, solid and liquid industrial wastes, demolition debris and household wastes. The fill materials were deposited haphazardly creating widely variable sub-surface patterns. There is no consistency in the fill. Depths range from zero to nine feet.

The underlying geology consists of the glacial tills of the Wedron Formation. This formation is comprised of the Wadsworth Till (the upper deposits), and the Lemont Drift (the lower deposits). Both tills consist of gray silty clays with traces of sand and gravel.

Three monitoring wells exist within the PVS portion of the site. The wells were installed during the closure process of a treatment lagoon. The wells are B10 (12.5 feet deep), B4 (13.3 feet deep) and B1 (12.8 feet deep). The water table was approximately nine feet below the surface during the 1996 sampling event, although the water levels fluctuate seasonally.

PVS Chemical had K & S Testing and Engineering Inc. conduct a geologic investigation towards the construction of a dike wall along the Calumet River. Two borings were drilled down to 20 feet. The boring logs described the near-surface soils as follows:

> The near surface soils at these boring locations consisted of fill materials extending to a depth of approximately 8 feet below existing ground. The fill soils primarily consisted of very loose to medium dense, brown and gray very moist to wet, sand with slag, concrete rubble, crushed brick and gravel. Underneath the fill soils loose to medium dense, gray fine sand was encountered and extended to a depth of approximately 19 feet. The loose fine sand was underlain by stiff gray, silty clay to the drilling termination depth of approximately 20 feet.

Groundwater was encountered at three feet in the first boring and at four feet in the second boring. The long term water table was estimated to be approximately three feet, based on the boring logs, local topography and changes in soil colors. There are no known drinking water wells in the area. The City of Chicago provides municipal water throughout the metro area from water obtained from Lake Michigan.

5.2 SURFACE WATER PATHWAY

The surface water pathway consists of Wolf Creek and the Calumet River. The Calumet River creates the 2200 foot long northeast border of the site. The River originates at Lake Michigan and is controlled to flow to the southwest. Wolf Creek is a perennial creek originating within the Wolf Lake - WMW Powers Conservation Area approximately 4000 feet to the east. The creek departs Wolf Lake and flows approximately 4600 feet to the site. The creek flows an additional 2000 feet through the site and finally discharges into the Calumet River.

The surface water 15 mile Target Distance Limit (TDL) consists of the Calumet River starting at the northwest corner of the site flowing to the south and west and stopping just west of Cicero Avenue (appendix B, 15 mile map). There are no known surface water intakes within the 15 mile TDL. The City of Chicago obtains its drinking water from intakes on Lake Michigan which are more than 4.7 miles upstream and another three miles along the Lake Michigan shoreline. The Calumet River is an established fishery. The area with a pH of 1.4 is located along the Calumet

River and Turning Basin #3. Runoff from this area possesses the potential to adversely effect the river or turning basin environments. Several designated State Natural Areas and endangered plants and animals exist along the Calumet River downstream from the site. The nearest environmentally sensitive area is approx 1.5 miles downstream. The impacted portion of Wolf Creek is within the site and ends at the north edge. Wolf Creek is not considered a state fishery. However, local residents have been observed fishing in the creek.

During the CERCLA SIP activities of March 1995, seven sediment samples were taken adjacent to the site, four samples from Wolf Creek, two from the Calumet River and one from the confluence of the two. Analysis of these samples documented observed releases along both waterways. Lead and arsenic met or exceeded the soil/sediment RAL's for the Wolf Creek samples. Several contaminants were found above background along the Calumet River, though none of them exceeded the soil/sediment RAL's. No additional sediment samples were collected during the March 1996 CERCLA STEP sampling event on the PVS portion of the site. However, soil sample X107 indicates a migration of contaminants from a washout area within the PVS portion of the site to Wolf Creek. Remedial activities on the inactive portion of the site include Wolf Creek. These activities are occurring with oversight provided by the Illinois EPA Site Remediation Program.

5.3 SOIL EXPOSURE PATHWAY

The on-site soils originally consisted of fine silts with sands and clays. The area has been filled with materials including slag, cinders, bricks, broken concrete and other materials as noted in the

Groundwater Migration Pathway section. Several railroad spurs exist or have been removed from the site. The rock and fill materials from the spurs are still present on-site. Fourteen soil samples were taken to characterize the nature of contamination within these on-site soils.

The PVS portion of the site is completely fenced in with a 24 hour security guard at the gate. There is an area of approximately 15 acres within the fenced area that is covered with contaminated soil including the area with a very low pH value (pH of 1.4). Approximately 80 employees work at PVS Chemical. There are no barriers preventing workers from contact with the contaminated soil. A residential area of approximately 2000 people exists to the southwest of the site. There are no known schools or daycare facilities on or adjacent to the site. Off-site migration is limited to heavy wind events due to the large soil particle sizes.

Several Designated State Natural Areas and endangered plants and animals exist within four miles of the site, though none are on or adjacent to the site. The threat of contaminant exposure is greatest for on site workers and especially for construction crews modifying the site by removing rail tracks, collecting soil borings and constructing the dike wall along the Calumet River.

5.4 AIR PATHWAY

The closest residential area lies approximately 700 feet to the southwest of the site. No air samples were collected during the CERCLA STEP investigation. There were no observed releases to the air during the investigation. The contaminants of concern are on or below the

surface and are mostly cinder or sand sized particles and not likely to migrate from the site.

SECTION 6 ADDITIONAL RISK BASED OBJECTIVES

6.1 INTRODUCTION

This section provides additional screening objectives used to evaluate the PVS Chemical owned portion of the Allied Chemical site. These objectives have not been used to assess the site for Hazard Ranking System (HRS) purposes. They are provided as additional references or to identify potential alternatives to the CERCLA remedial process.

6.2 TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES (TACO)

The Illinois EPA's *Tiered Approach to Corrective Action Objectives* (TACO) guidance document (proposed rules under 35 IL Adm. Code Part 742), can be utilized to develop site specific remediation objectives. TACO is a three tiered approach utilizing an increased amount of site specific information for each successive tier. This section discusses the risk-based remediation objectives for the soil and groundwater pathways within Tier 1 of the TACO document. Tier 1 consists of "look-up" tables based on simple numeric models for either the Residential or Industrial/Commercial scenarios. The Illinois EPA Site Remediation Program (formerly the Voluntary Program), utilizes TACO derived objectives when determining site specific remedial practices and clean up objectives.

6.2.1 TACO SOIL OBJECTIVES

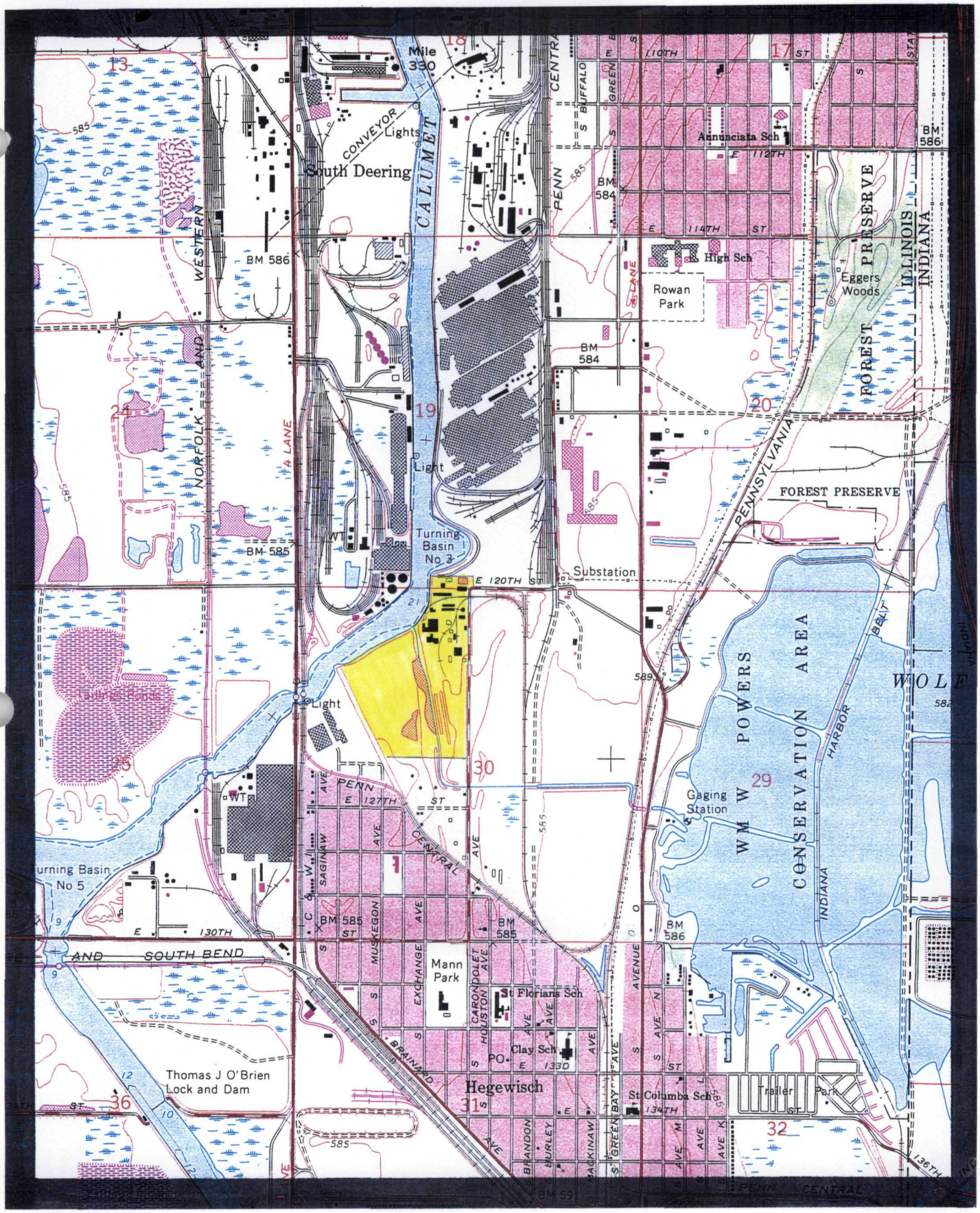
The corrective action soil objectives for the PVS Chemical site were obtained from the inhalation, ingestion and migration to groundwater routes of the Tier 1 Industrial/Commercial scenario. The Industrial/Commercial scenario is based on the present land usage for the site. Changes in land usage will require a reevaluation of the scenarios (Industrial/Commercial or Residential) and groundwater classes (Class I or II) by the Illinois EPA. The site specific contaminants and the TACO Tier 1 objectives can be found in Tables 2 & 3. The TACO objectives were not applicable for the area around soil sample X102 because of the low pH value. TACO objectives do not apply to contaminants with a pH below 2 or above 8. However, if the soils are properly neutralized, to acceptable TACO pH levels, the Tier I objectives may be used. Benzo(a)pyrene, Dibenz(a,h)anthracene, arsenic, beryllium, chromium, lead, mercury and selenium were the contaminants that exceeded the TACO cleanup objectives.

6.2.2 TACO GROUNDWATER OBJECTIVES

The corrective action groundwater objectives for the PVS Chemical site were obtained from the Class II groundwater category of the Tier 1 Groundwater Cleanup Objectives (Table E). According to 36 IL Adm. Code 620, the groundwater beneath this site is Class II. The decision was based on the following: no potable water supply wells are within the minimum set-back zone; no unconsolidated sand, gravel or sand and gravel deposits greater than five feet are present; and drinking water in the area is supplied by the City of Chicago from Lake Michigan. The site specific contaminants and the TACO Tier 1 objectives can be found in Table 2. Dieldrin and arsenic exceeded the Tier 1, Class II groundwater cleanup objectives.

Allied Chemical Site
JO DAVIESS
STEPHENSON
WINNEBAGO
BOONE
McHENRY
LAKE
CARROLL
OGLE
DEKALB
KANE
COOK
DU PAGE
WHITESIDE
LEE
KENDALL
LASALLE
HENRY
BUREAU
GRUNDY
ROCK ISLAND
MERCER
KANKAKEE
STARK
PUTNAM
KNOX
MARSHALL
LIVINGSTON
WARREN
HENDERSON
PEORIA
WOODFORD
IROQUOIS
McLEAN
FULTON
HANCOCK
McDONOUGH
FORD
VERMILION
TAZEWELL
CHAMPAIGN
SCHUYLER
LOGAN
DEWITT
ADAMS
MASON
MENARD
CASS
MACON
BROWN
MORGAN
SANGAMON
PIATT
DOUGLAS
EDGAR
PIKE
MOULTRIE
COLES
SCOTT
GREENE
MACOUPIN
CHRISTIAN
CLARK
CALHOUN
CUMBERLAND
MONTGOMERY
SHELBY
JERSEY
FAYETTE
JASPER
MADISON
BOND
EFFINGHAM
CRAWFORD
CLAY
RICHLAND
LAWRENCE
MARION
CLINTON
ST CLAIR
WAYNE
EDWARDS
WABASH
JEFFERSON
MONROE
WASHINGTON
RANDOLPH
PERRY
WHITE
HAMILTON
FRANKLIN
JACKSON
SALINE
GALLATIN
WILLIAMSON
UNION
JOHNSON
POPE
HARDIN
ALEXANDER
PULASKI
MASSAC
SITE LOCATION
NORTH

FIGURE 1



SITE LOCATION MAP

QUADRANGLE LOCATION

FIGURE 2

SITE LAYOUT MAP

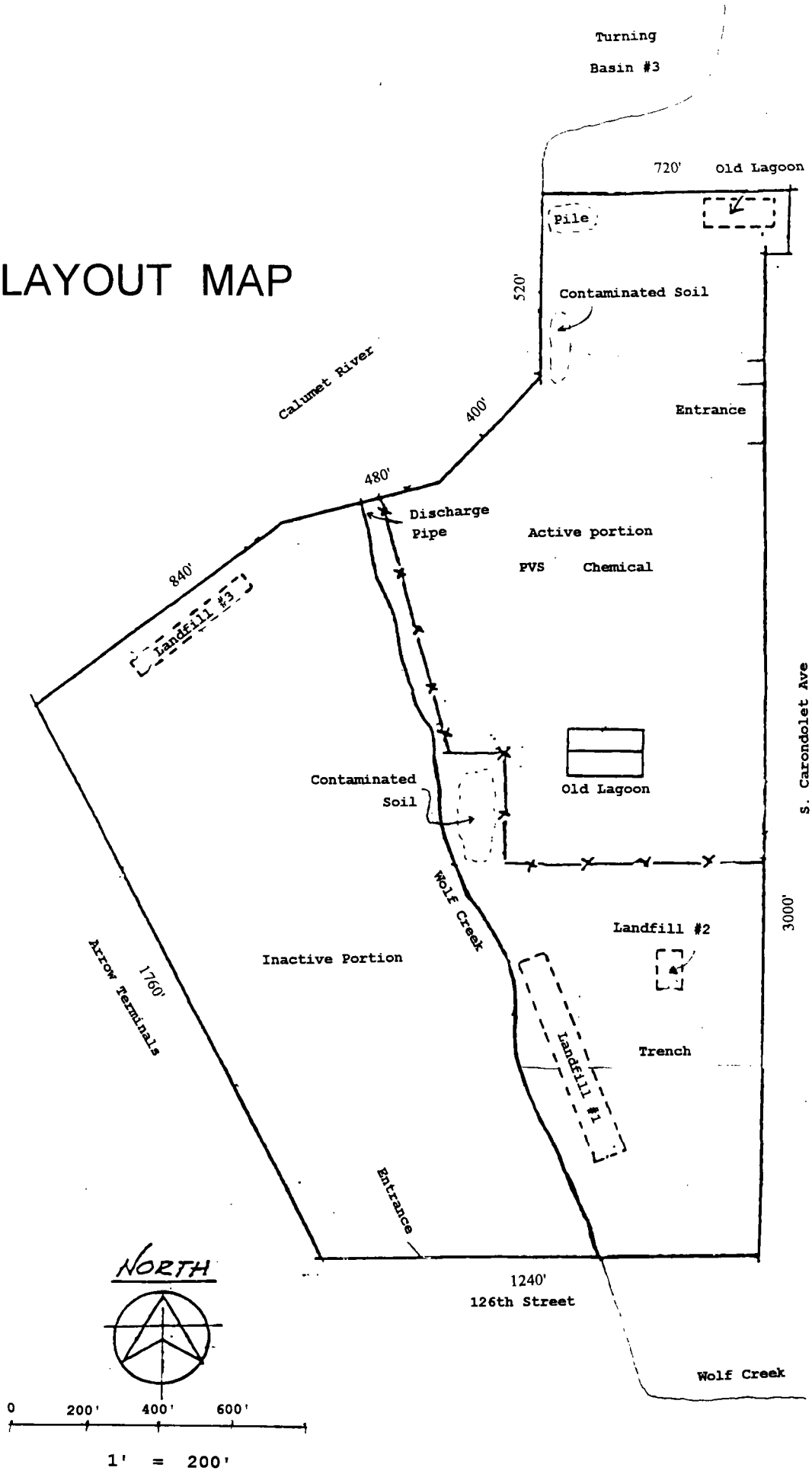
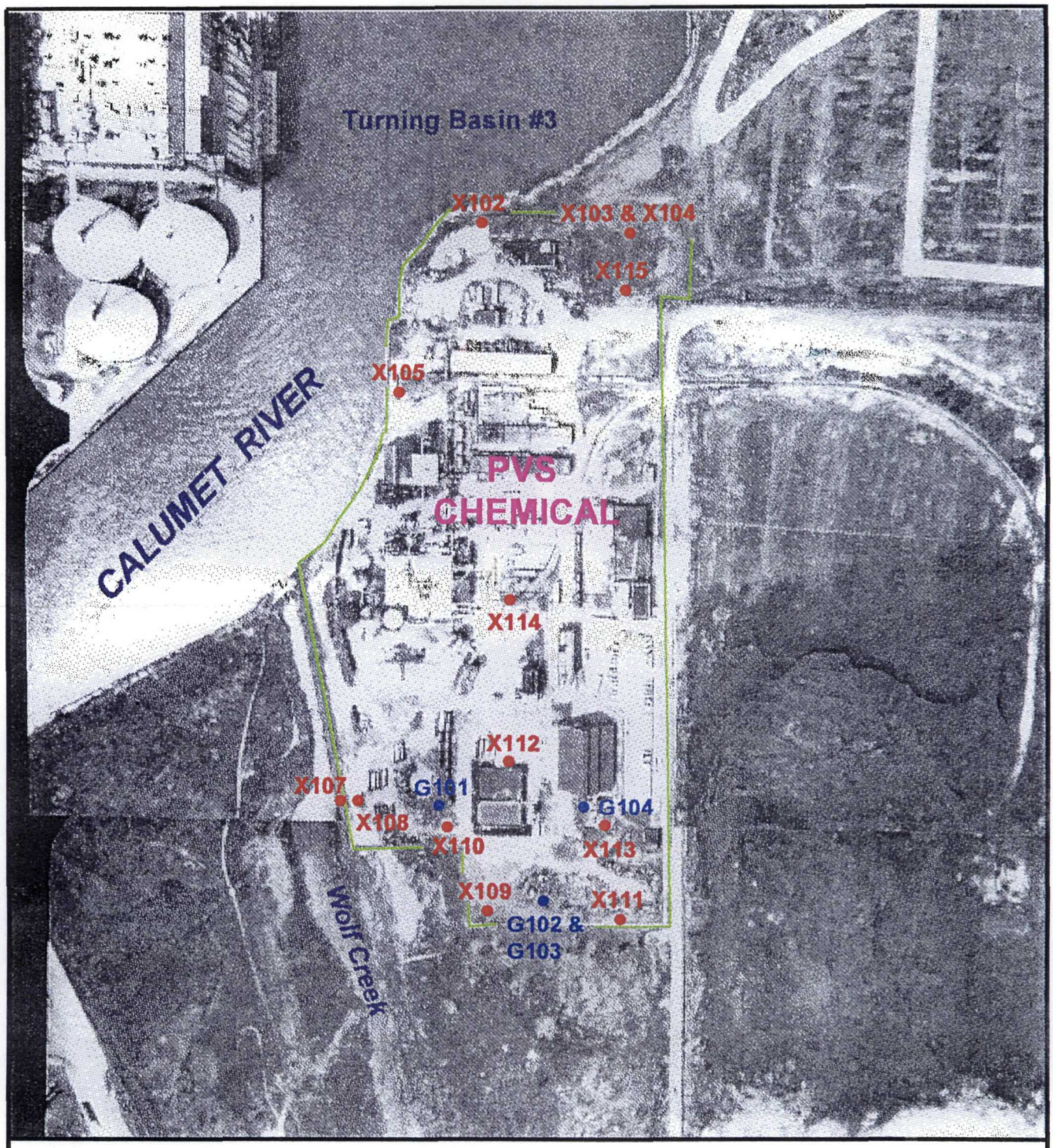


FIGURE 3



PVS - CHEMICAL SAMPLE LOCATIONS

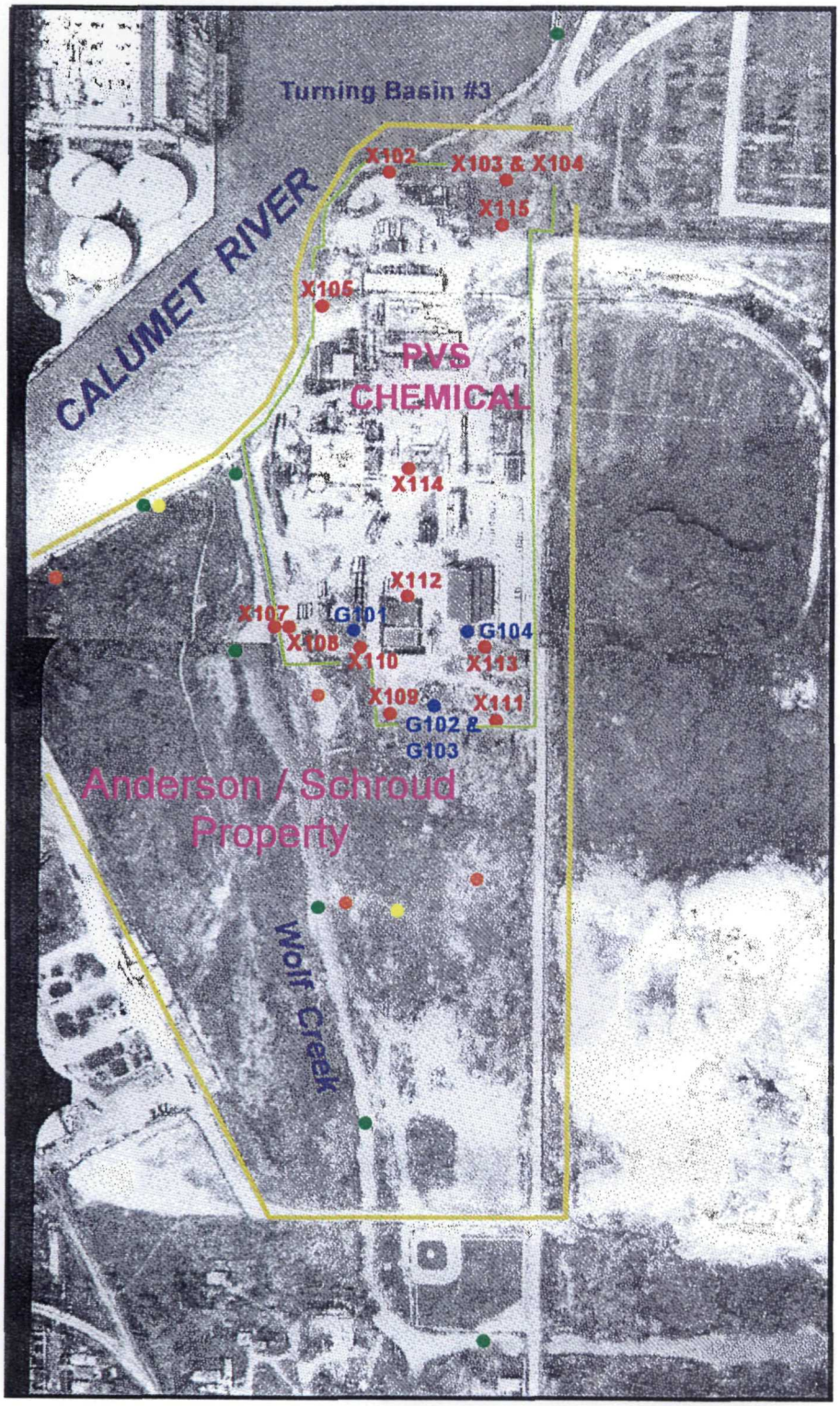
Soil Sample

Groundwater Sample

PVS Property Line

N
W
E
S

FIGURE 4



LEGEND

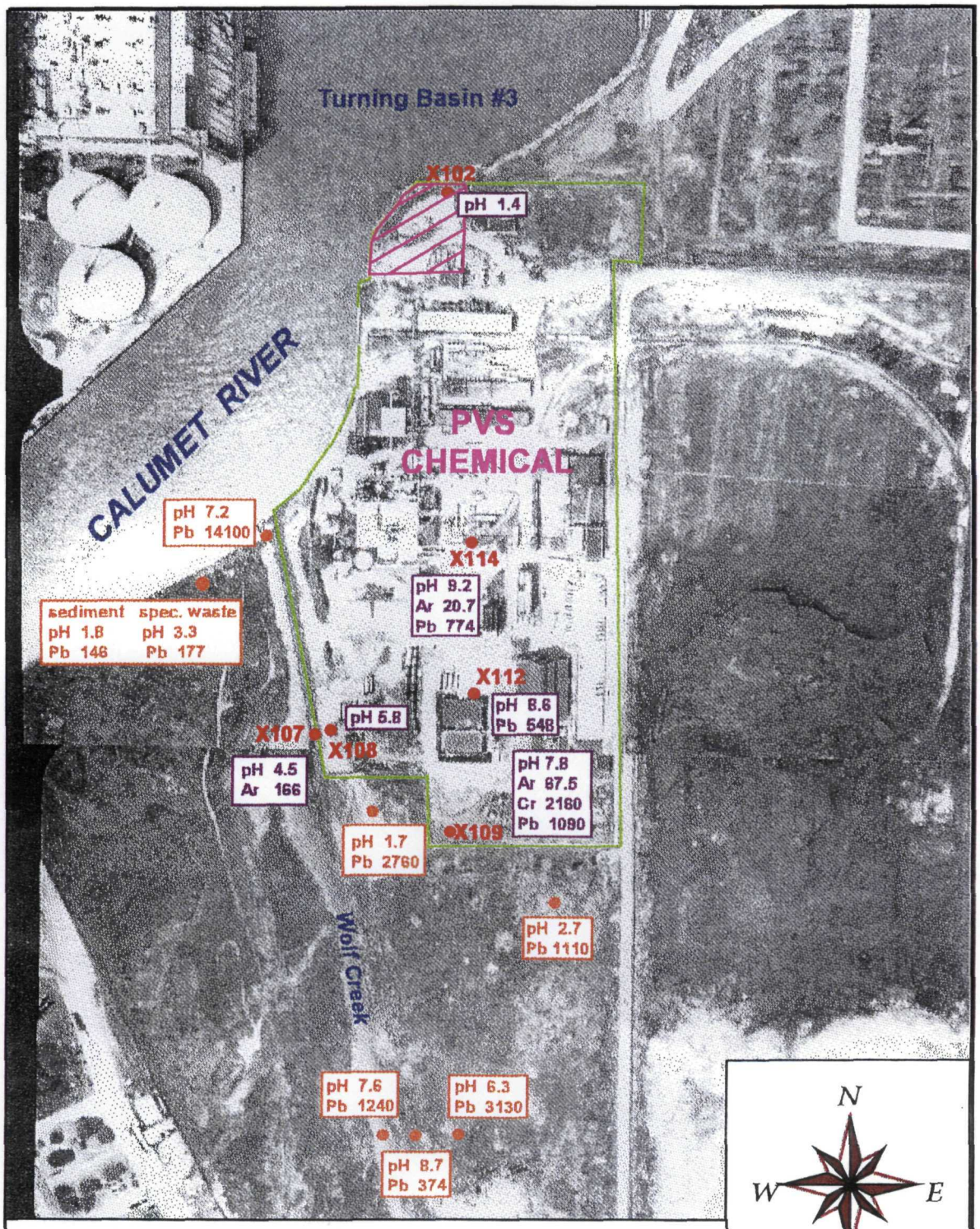
- Soil Sample PVS Property
- Groundwater Sample PVS Property
- Special Waste Sample Anderson / Schroud Property
- Sediment Sample Anderson / Schroud Property
- Soil Sample Anderson / Schroud Property
- PVS - Property Line
- Allied Chemical Property Line

N
W E
S

SAMPLE LOCATIONS

ALLIED CHEMICAL CORP. PROPERTIES
INCL:
PVS CHEMICAL & ANDERSON / SCHROUD

FIGURE 5



ALLIED CHEMICAL -- PVS CHEMICAL

INORGANIC & pH LEVELS

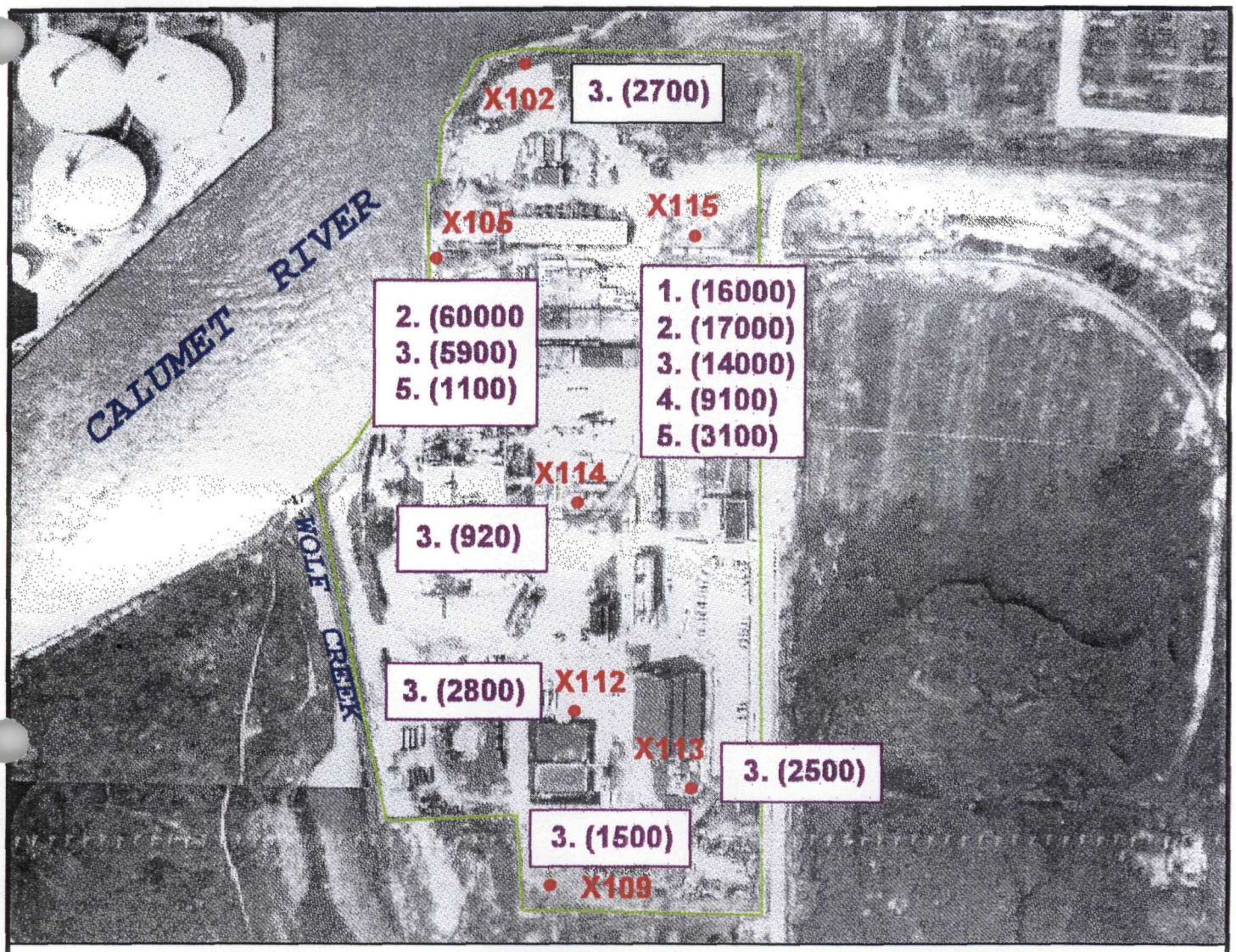
Location where storage building collapsed dumping sulfur wastes into Calumet River & onto shoreline (NOTE low pH value of sample).

On-site soil sample.
Values in box are pH and Inorganic (ppm) values.

Off-site samples (sediment, soil or special waste).
Values in box are pH and inorganic (ppm) values.

PVS -- Site Boundary

FIGURE 6



ALLIED CHEMICAL -- PVS CHEMICAL

SEMIVOLATILE LEVELS

1. - Benzo(a)Anthracene - [conc. in ppb]
2. - Benzo(b)Fluoranthene - [conc. in ppb]
3. - Benzo(a)Pyrene - [conc. in ppb]
4. - Indeno(1,2,3-cd)Pyrene - [conc. in ppb]
5. - Dibenz(a,h)Anthracene - [conc. in ppb]

PVS CHEMICAL Property Line

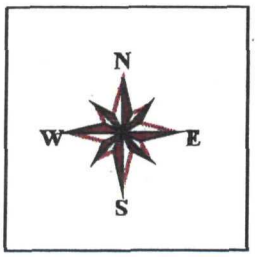
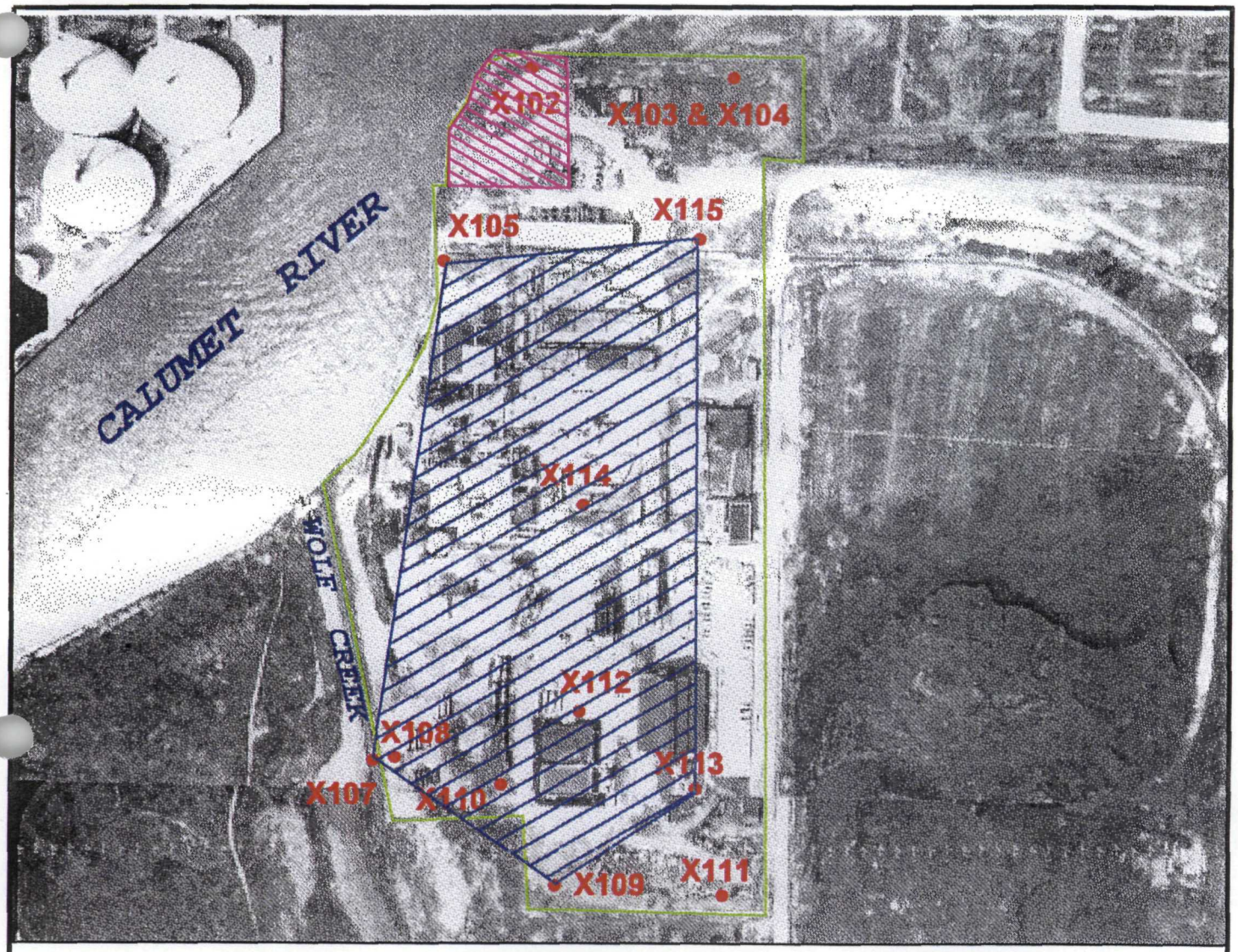


FIGURE 7



ALLIED CHEMICAL -- PVS CHEMICAL

SITE SOURCES

LOW pH SOURCE AREA

CONTAMINATED SOIL AREA

PVS CHEMICAL Property Line

N
W E
S
Not to Scale

FIGURE 8

SAMPLE DESCRIPTIONS & LOCATIONS

SOIL SAMPLES

SAMPLE	DEPTH	APPEARANCE	LOCATION	JUSTIFICATION
X101	0" - 4"	Black silt loam	500ft east of Avenue O and 36' north of west bound access Rd at WMW Powers Conservation Area.	Background sample
X102	0" - 4"	Red cindery material w/ sulfur on surface	44ft south of Turning Basin #3 & 71ft north of road in northwest corner of site.	Characterize contaminated soil zone
X103 & X104	6" - 8"	Clay loam soil	18ft south of north fence line & 150ft east of east fence Located in northeast corner of site.	Characterize contaminated soil zone Duplicate samples
X105	0" - 4"	Silty loam w/ gravel over slag	12ft east of Calumet River - where river turns from N/S to NE/SW.	Characterize contaminated soil zone
X106	SAMPLE NOT COLLECTED DUE TO SLAG AT SURFACE			
X107	0" - 6"	Maroonish/red cindery material	Collected immediately outside west fence line 97ft north of southwest fence corner.	Characterize contaminated soil zone Determine migration off site to creek
X108	0" - 4"	Same as X107 but w/ darker silt above slag	97ft north of southwest fence corner & 6ft east of west fence.	Characterize contaminated soil zone
X109	8" - 12"	Sandy loam w/ slag	Inside south fenceline & 20ft from southwest fence corner.	Characterize contaminated soil zone
X110	0" - 2.5"	1 - 2" of silt on black material over slag	181ft north of south fence line & 161ft west of west fence	Characterize contaminated soil zone
X111	6" - 12"	Sandy loam w/ slag	210ft west of southeast fence line & 4ft north of south fence line.	Characterize contaminated soil zone
X112	0" - 4"	4" of loam w/ rocks on hard barrier (lagoon barrier)	3ft north of top of storage lagoon & 6ft west of northeast corner of lagoon.	Characterize contaminated soil zone
X113	4" - 8"	Grey/wht rounded sand like material in silty loam over slag	118ft west of east fence & 11ft south of storage building.	Characterize contaminated soil zone
X114	0" - 4"	Sandy loam on slag and cinders	Collected in center of facility 78ft east of liquid sulfur trioxide bldg & 15ft north of utility pole at roadway.	Characterize contaminated soil zone
X115	0" - 4"	White crystals (salt?) on brown sandy loam over slag	65ft west of east fence & 56ft north of utility pole in northeast corner of facility.	Characterize contaminated soil zone

GROUNDWATER SAMPLES

SAMPLE	WELL NUMBER	WELL DEPTH	WATER TABLE	LOCATION	
G101	B1	12.8ft	5ft	West of Storage lagoon between rail spurs.	Identify potential migration to groundwater
G102 & G103 Duplicates	B4	13.3ft	5.5ft	South of storage lagoon 15ft north of southern fence line	Identify potential migration to groundwater
G104	B10	12.5ft	4.5ft	Alongside shed south of Shop building to east of storage lagoon.	Identify potential migration to groundwater

TABLE 1

ALLIED CHEMICAL – PVS CHEMICAL ILD 001833714

SOIL SAMPLE SUMMARY

		SAMPLE LOCATIONS															
	TACO * Cleanup Objectives	X 101 8-21-96 background	X 102 8-21-96 **	X 103 8-21-96	X 104 8-21-96	X 105 8-21-96	X 107 8-20-96	X108 8-20-96	X109 8-20-96	X110 8-20-96	X111 8-20-96	X112 8-20-96	X113 8-20-96	X114 8-20-96	X115 8-21-96	USEPA CERCLA BENCHMARKS SCDMs (ppb)	RALs (ppb)
				Duplicates													
VOLATILES (ppb)	(ppb)																
Methylene Chloride	25000			7 J	4 J											78000	-----
1,1,1-Trichloroethane	1200000	4 J	21	68	20			22 J	11 J	19 J			6 J	8 J		-----	70000000
SEMIVOLATILES (ppb)																	
Isophorone	4600000												120 J			610000	42000000
Naphthalene	8200000					93 J			85 J	78 J		200 J	86 J		2100	-----	500000-1000000
2-Methylnaphthalene										100 J		140 J			900 J	-----	
Dimethylphthalate											170 J		200 J			5800000000	-----
Acennaphthylene										120 J			100 J			-----	-----
Acenaphthene	120000000					640			94 J			470	230 J		3800	35000000	500000-1000000
Dibenzofuran						230 J				72 J		310 J	110 J		1700 J	-----	500000-1000000
Fluorene	82000000					570			110 J			640	240 J		3800	23000000	500000-1000000
Phenanthrene		160 J	3400			4900			1400	750 J		6000	2200 J	610	21000	-----	500000-1000000
Anthracene	610000000		470 J			1100			290 J	150 J	88 J	770	490 J	110 J	5300	170000000	500000-1000000
Carbazole	290000					840			190 J	110 J		720	350 J	98 J	4700	-----	
Fluoranthene	82000000	420 J	5700			9800			2200	1300 J		6700	4100	1500	34000	-----	500000-1000000
Pyrene	61000000	310 J	3600			8200			1400			2800	1700 J		27000	17000000	500000-1000000
Benzo(a)Anthracene	8000	240 J	3000			5900			1500	840 J		2800	2000 J	770	16000	-----	500000-1000000
Chrysene	780000	240 J	4200			6500			1600	1000 J		2600	2100 J	1000	17000	-----	500000-1000000
Bis(2-Ethylhexyl)Phthalate	410000								430	310 J			1100 J	840		42000	12000000
Benzo(b)Fluoranthene	8000	370 J	4000			6000			1600	1100 J		3000	2700 J	1300	17000	23000	-----
Benzo(k)Fluoranthene	78000		3600			3800			1400	760 J	280 J	2300	1900 J	910	13000	-----	500000-1000000
Benzo(a)Pyrene	800	200 J	2700			5900			1500	660 J		2800	2500 J	920	14000	80	500000-1000000
Indeno(1,2,3-cd)Pyrene	8000	150 J	2100 J			4200 J			650			750	910 J	450	9100 J	-----	500000-1000000
Dibenz(a,h)Anthracene	800					1100 J					140 J	300 J	330 J		3100	-----	500000-1000000
Benzo(g,h,i)Perylene				730		2600 J			380		290 J	470	700 J		5700 J	-----	500000-1000000
TOTAL TICs		**30**	**30**	**30**		**30**	**28**	**29**	**30**	**30**	**21**	**30**	**30**	**30**	**30**		
PESTICIDES (ppb)																	
alpha-BHC	900			0.41 JP	0.28 JP			0.87 J								93	-----
beta-BHC		0.39 JP	2.7 JPD													320	-----
delta-BHC										5.4 JPD	12 P	19 P	25 PD			-----	-----
gamma-BHC (Lindane)	4000							0.2 JP	0.65 JP	0.26 P						450	
Heptachlor	1000	0.32 JP													3.9 JPD	130	38000
Heptachlor epoxide	600							3.5 P								64	
Dieldrin	400	0.43 JP		0.29 JP		7.6 P	18 JPD		7.6 P	8.9 JPD	1.5 JP		29 JPD	28 JPD		36	11000
Endrin	61000	4 JP	42 P			40 P	44 PD		31 P	63 D			100 P	120 PD	94 PD	170000	230000
Endosulfan II	1200000	2.7 J	50 P			18	140 PD	13 P	23	41 PD			110 D	51 PD	34 JPD	3500000	390000
4,4'-DDD	24000	6.1	13 P										31 JPD		35 JPD	2400	710000
Endosulfan sulfate					0.93 JP		22 JPD									-----	-----
4,4'-DDT	17000	5.8 P	150 PD			22 P	28 JPD		51 P	49 PD			25 JPD	46 PD	140 PD	1700	390000
Methoxychlor (Mariate)	1000000	11 J				55 P										2900000	
Endrin Ketone		2.9 JP	45 P				21 JPD	32 B	17 P	15 JPD				58 BPD		-----	
Endrin aldehyde		2.6 JP				16 P	120 PD		15 P	37 PD	9.8 P		93 PD	89 PD		-----	-----
alpha-Chlordane				0.28 JP												450	47000
gamma-Chlordane			8.4 P	0.26 JP		4.7 P	0.67 JPD	11	7.9 P			4.1 P	9.3 P	17 JPD	28 D	450	47000
Toxaphene	5200			30 JP						1300 DJ						530	150000
Aroclor-1254	25000	39 J	690 PD			220 P	1500 D		320	380 D			1200 D	1200 D	720 D	76	22000
Aroclor-1260	25000	45 JP	900 D			340 P	3300 D	170	330	810 D		200	1800 D	1500 D	830 PD	76	22000
INORGANICS (ppm)	(ppm)															(ppm)	(ppm)
pH		**7.00**	**1.40**	**7.8**		**7.50**	**4.50**	**5.80**	**7.80**	**7.00**	**7.80**	**8.60**	**7.20**	**9.20**	**7.90**		
Arsenic	3	6.8					166		67.5					20.7		0.33	8 - 200
Barium	14000	92.4									370			401	276.00	41000	
Beryllium	1	0.9 B									6.1				3.6	0.14	40
Cadmium	200	1.4 B							8.8		3.20			6	6.7	290	25
Chromium	420	71.6							2160							2900	200 - 400
Cobalt	12000	8.5 B														-----	
Copper	8200	24.1							109	77.3		123		476		-----	5000
Lead	400	75.2					394		1090	334		548	238	774		-----	500 - 1000
Mercury	61	†	0.55			0.13	0.15 (.05)		3.26	0.48		3.79	0.31	1.19		170	1600
Selenium	1000	.38B †							19.5 (2.4)		1.20 B					2900	2300
Silver									1.40 B					3.8	1.70 B	2900	2300
Vanadium		35.7							183							4100	
Zinc	61000	163							814			426	456	1660		170000	160000
Cyanide	4100	0.79				4.7										12000	12 - 50

* These cleanup objectives were taken from the IEPA's "Tiered Approach to Cleanup Objectives Guidance Document". The cleanup objectives were based on the Industrial Scenario with Class II groundwater.

P Indicates a pesticide/Aroclor analyte when a greater than 25% difference between columns exists. The lower of the two concentrations is reported.

J Indicates an estimated value. D Indicates an identified analyte has been diluted. B Indicates that the contaminant was found in the associated blank.

Concentrations that appear in red have exceeded the TACO cleanup objectives. -- With the exception of all values in Yellow Column.

**** Column in Yellow exceeds pH characteristics for Hazardous Waste**
TACO Cleanup Objectives cannot be utilized for this sample location.

† Indicates a pH based Cleanup Objective & the (#) in parenthesis is pH based objective.

TABLE 2

ALLIED CHEMICAL -- PVS CHEMICAL ILD 001833714

GROUNDWATER SAMPLE SUMMARY

	SAMPLE LOCATIONS					USEPA CERCLA BENCHMARKS	
	TACO* Cleanup Objectives	G101 8-20-96	G 102 8-20-96	G 103 8-20-96	G 104 8-20-96	MCLs**	Cancer or Ref. Dose
			Duplicates				
VOLATILES (ppb)	(ppb)					(ppb)	(ppb)
Carbon Disulfide	3500	4 J	13	4 J		-----	3500
VOA -TICs							
Ethane, 1,2-Diethoxy		-----	14 JN	12 JN	-----		
Silane, Fluorotrimethyl		-----	-----	21 JN	-----		
SEMIVOLATILES (ppb)							
Phenanthrene	-----	-----	4 J	-----	-----	-----	-----
Di-n-Butylphthalate	3500	-----	-----	-----	3 J	-----	3500
Fluoranthene	1400	-----	6 J	-----	3 J	-----	-----
Pyrene	1050	-----	3 J	-----	-----	-----	1100
Benzo(a)anthracene	0.65	-----	3 J	-----	-----	-----	-----
Chrysene	7.5	-----	2 J	-----	-----	-----	-----
TICs							
Caprolactam		180 JN	130 J	-----	-----		
Bicyclo[2.2.1]Heptan-2-One,		-----	5 JN	-----	-----		
Unknowns		13	14	-----	26		
PESTICIDES (ppb)							
Heptachlor epoxide	1	0.056 P	-----	-----	-----	0.2	0.003
Dieldrin	**0.01**	-----	**0.082** J	-----	-----	-----	0.002
Endrin	10	-----	-----	-----	0.01 JP	2	11
Endrin Ketone	-----	-----	-----	-----	0.022 JP	-----	-----
Endrin aldehyde	-----	-----	-----	-----	0.011 JP	-----	-----
gamma-Chlorodane	10	-----	-----	-----	0.004 JP	2	0.027
Aroclor-1248	2.5	-----	-----	-----	1.1	0.5	0.0045
Aroclor-1254	2.5	-----	-----	-----	0.49 JP	0.5	0.0045
Aroclor-1260	2.5	-----	-----	-----	0.35 J	0.5	0.0045
INORGANICS (ppb)							
Arsenic	**200**	**1376**	-----	-----	-----	**50**	0.02
Manganese	10000	1050	983	989	3330	-----	180
Zinc	10000	7440	-----	-----	205	-----	11000
Sulfate	400000	7100000	775000	772000	963000	-----	-----
pH		*6.8*	*6.8*	-----	*6.2*		

* These Cleanup Objectives were taken from the IEPA's "Tiered Approach to Corrective Action Objectives Guidance Document". The cleanup objectives were based on the Industrial Scenario with Class II groundwater.

** Maximum Concentration Levels

Bold-faced Values meet or exceed Benchmarks or Cleanup Objectives.

TICs Tentatively Identified Compounds (compound not part of Target Compound List).

JN Concentration of TIC is an estimated value.

TABLE 3

APPENDIX A

SITE PHOTOGRAPHS

SITE NAME:	ALLIED CHEMICAL - PVS
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	10:00 AM
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 1
Sample :	G104
Direction:	North
COMMENTS:	
Sample collected from Monitoring Well	
B10 located at SE corner of PVS	

DATE:	08/20/96
TIME:	10:00 AM
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 2
SAMPLE #	G104
Direction:	East
Comments:	
See above	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	10:15 AM
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 3
Sample :	G102 & G103
Direction:	South
COMMENTS:	Duplicates
Sample collected from Monitoring Well	
B4 Located in south end of PVS	

DATE:	08/20/96
TIME:	10:15 AM
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 4
SAMPLE #	G102 & G103
Direction:	Southwest
Comments:	Duplicates
See above	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	11:00 AM
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 5
Sample :	G101
Direction:	North
COMMENTS:	
Sample collected from Monitoring Well	
B1 located between rail spurs	
on west edge of storage lagoon	

DATE:	08/20/96
TIME:	11:00 AM
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 6
SAMPLE #	G101
Direction:	South
Comments:	
See above	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	12:00 PM
PHOTO by:	Ted Prescott
Roll / Photo # :	photo 7
Sample :	X114
Direction:	West

COMMENTS:

Sample collected in center of production - storage area. Soil was cindery with slag at approx 2 inches.

DATE:	08/20/96
TIME:	12:00 PM
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 8
SAMPLE #	X114
Direction:	South

Comments:

See above

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	12:30 PM
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 9
Sample :	X109
Direction:	South
COMMENTS:	
Collected along southern fence-line	

DATE:	08/20/96
TIME:	12:30 PM
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 10
SAMPLE #	X109
Direction:	Southwest
Comments:	
See above	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	12:00 AM
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 11
Sample :	X111
Direction:	South
COMMENTS:	
Sample collected at Southeastern	
corner of site	
Photo Board should read X111.	

DATE:	08/20/96
TIME:	1300
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 12
SAMPLE #	X111
Direction:	East
Comments:	
See above	
Photo Board should read X111	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	1315
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 13
Sample :	X110
Direction:	West
COMMENTS:	
Sample collected near southwest corner of storage lagoon.	

DATE:	08/20/96
TIME:	1315
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 14
SAMPLE #	X110
Direction:	South
Comments:	
See above	

SITE NAME: ALLIED CHEMICAL - PVS CHEMICAL

ILD 001833714 | COUNTY: Cook

DATE:	08/20/96
TIME:	1330
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 15
Sample :	X113
Direction:	East
COMMENTS:	
Collected south of Shop Bldg.	

DATE:	08/20/96
TIME:	1330
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 16
SAMPLE #	X113
Direction:	West
Comments:	
See above	

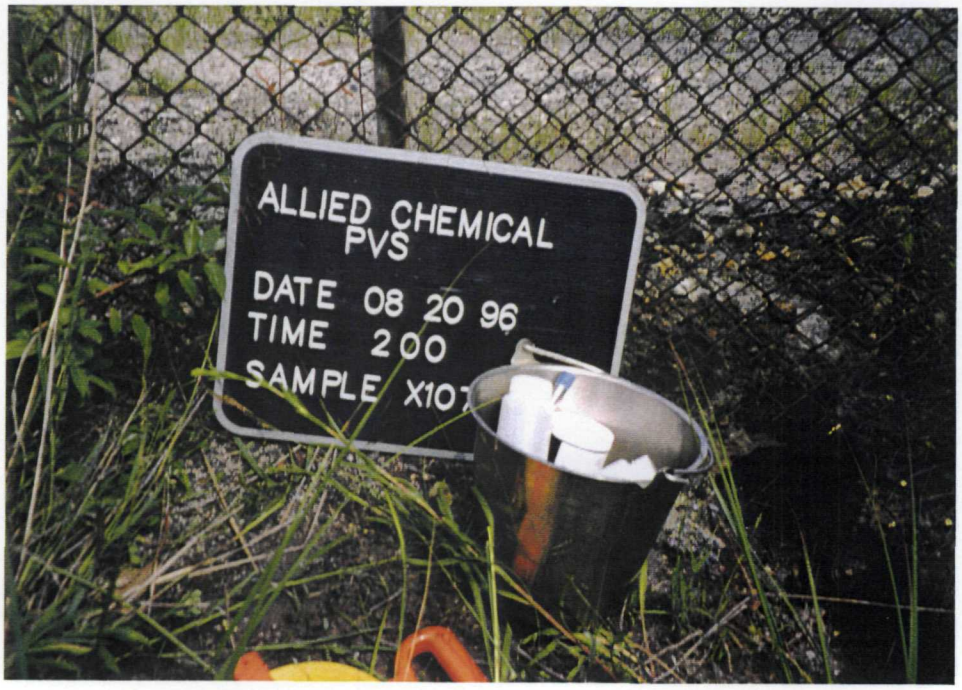
SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	1345
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 17
Sample :	X112
Direction:	East
COMMENTS:	
Sample collected immediately north of storage lagoon.	

DATE:	08/20/96
TIME:	1345
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 18
SAMPLE #	X112
Direction:	South
Comments:	
See above	
Black is lagoon berm	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	1400
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 19
Sample :	X107
Direction:	East
COMMENTS:	
Collected outside western fence line	
in runoff gully (right).	



DATE:	08/20/96
TIME:	1400
PHOTO by:	
Roll / Photo #:	
SAMPLE #	X107
Direction:	
Comments:	
NO PHOTO	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/20/96
TIME:	1415
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 21
Sample :	X108
Direction:	South
COMMENTS:	
Collected w/in western fence line	
adjacent to Sample X107	

DATE:	08/20/96
TIME:	1415
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 22
SAMPLE #	X108
Direction:	East
COMMENTS:	
See above	

SITE NAME: ALLIED CHEMICAL - PVS CHEMICAL

ILD 001833714 | **COUNTY:** Cook

DATE:	08/21/96
TIME:	0845
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 23
Sample :	X115
Direction:	South

COMMENTS:

Collected at northern end of site

White powder on ground may be salt

DATE:	08/21/96
TIME:	0825
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 24
SAMPLE #	X115
Direction:	West

Comments:

See above

White powder on ground may be salt.

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/21/96
TIME:	0900
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 25
Sample :	X103 & X104
Direction:	South
COMMENTS:	Duplicates
Collected at north central end of site.	

DATE:	08/21/96
TIME:	0900
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 26
SAMPLE #	X103 & X104
Direction:	West
Comments:	Duplicates
See above	

SITE NAME: ALLIED CHEMICAL - PVS CHEMICAL

ILD 001833714 | COUNTY: Cook

DATE:	08/21/96
TIME:	0930
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 27
Sample :	X102
Direction:	Northwest
COMMENTS:	
Collected at northwestern edge of site	
Just south of Turning basin #3	

DATE:	08/21/96
TIME:	0930
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 28
SAMPLE #	X102
Direction:	South
Comments:	
See above	

SITE NAME:	ALLIED CHEMICAL - PVS CHEMICAL
ILD 001833714	COUNTY: Cook

DATE:	08/21/96
TIME:	0945
PHOTO by:	Ted Prescott
Roll / Photo # :	Photo 29
Sample :	X105
Direction:	West
COMMENTS:	
Collected along Calumet River Wall	
at west end of site.	

DATE:	08/21/96
TIME:	0945
PHOTO by:	Ted Prescott
Roll / Photo #:	Photo 30
SAMPLE #	X105
Direction:	North
Comments:	
See above	

APPENDIX B

TARGET COMPOUND LIST

TARGET COMPOUND LIST

Volatile Target Compounds

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

Base/Neutral Target Compounds

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl) Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis (2-Chloroisopropyl) Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene

Pesticide/PCB Target Compounds

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

Inorganic Target Compounds

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

N	Not used	Spiked sample (a QC parameter not met).
S	Not used.	The reported value was determined by the Method of Standard Additions (MSA).
W	Not used.	Post digestion spike for Furnace AA analysis (a QC parameter) is out of control limits of 85% to 115% recovery, while sample absorbance is less than 50% of spike absorbance.
*	Not used.	Duplicate analysis (a QC parameter not within control limits).
+	Not used.	Correlation coefficient for MSA (a QC parameter) is less than 0.995.
P	Not used.	Method qualifier indicates analysis by ICP (Inductively Coupled Plasma) Spectroscopy.
CV	Not used.	Method qualifier indicates analysis by Cold Vapor AA.
AV	Not used.	Method qualifier indicates analysis by Automated Cold Vapor AA.
AS	Not used.	Method qualifier indicates analysis by Semi-Automated Cold Spectrophotometry.
T	Not used.	Method qualifier indicates Titrimetric analysis.
NR	The analyte was not required to be analyzed.	The analyte was not required to be analyzed.
R	Rejected data. The QC parameters indicate that the data is not usable for any purpose.	Rejected data. The QC parameters indicate that the data is not usable for any purpose.

APPENDIX C

SITE 4-MILE RADIUS MAP
SITE 15-MILE SURFACE WATER MAP

SDMS US EPA Region V

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Appendix C – Site 4-Mile Radius Map & Site 15-Mile Radius Map

Document is available at the EPA Region 5 Records Center.

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