United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-88/071
September 1988

EPA

Superfund Record of Decision:

Ninth Avenue Dump, IN

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R05-88/071	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Ninth Avenue Dump, IN
First Remedial Action

5. Report Date 09/20/88

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Ninth Avenue Dump (NAD) is a 17-acre inactive chemical and industrial waste disposal site located in Gary, Indiana. NAD is located in a low-lying area with poor drainage. Prior to filling, the site consisted of parallel ridges separated by wetlands areas. Hazardous waste disposal activities occurred at the site from early to mid 1970s with some filling continuing until 1980. The site accepted dry industrial, construction and demolition waste, oil, solvents, paint solvents and sludges, resins, ds, and flammable, caustic and arsenic-contaminated materials. A small-scale auto ecking operation has reportedly been observed at the property in 1975 by the Indiana State Board of Health (ISBH) which documented the presence of 10,000 55-gallon drums at the site, many of which were empty. Additionally, the inspection estimated approximately 500,000 gallons of liquid industrial waste and 1,000 buried drums present at the site. Subsequent inspection revealed portions of discarded auto batteries, drummed liquid wastes, and abandoned tanker trucks. In 1975 and 1980 EPA ordered the site operator to initiate surface cleanups. Subsequently, he removed some barrels, junk cars, and trucks. This first operable unit addresses remediation of an oil layer floating on the ground water surface, the principal environmental threat at the site. The quantity of oil under the site is estimated at 250,000 to 700,000 gallons, of which
(See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision
Ninth Avenue Dump, IN
First Remedial Action
Contaminated Media: gw
Key Contaminants: metals, organics (PCBs), PAHs, VOCs (benzene, toluene, xylenes)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 48
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

EPA/ROD/R05-88/071
:h Avenue Dump, IN
_st Remedial Action

16. ABSTRACT (continued)

100,000 to 500,000 gallons are estimated to be recoverable. Several organic and inorganic contaminants have been detected in the oil in higher concentrations than in other media. Oil seeps have been observed in onsite ponds leading to concerns that the oil may be affecting aquatic life, and an oil sheen has been seen on several surface water bodies. The second operable unit will address buried waste, contaminated soil, and contaminated ground water. The primary contaminants in the oil layer include: VOCs, benzene, toluene, xylene, PAHs, organics, PCBs, metals, and cyanides.

The selected remedial action for this site includes: construction of a soil-bentonite slurry wall to completely surround the hydrocarbon layer; separate extraction of oil and ground water through a series of central extraction wells, followed by storage of the recovered oil in an onsite storage tank and recharge of the treated ground water through recharge wells; and ground water monitoring. Oil treatment will be evaluated in the second operable unit. The estimated capital cost for this remedial action is $1,960,000 with annual O&M of $190,000.

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Ninth Avenue Dump
Gary, Indiana

This decision document represents the selected remedial action for the Ninth Avenue Dump site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This decision is based on the contents of the administrative record for the Ninth Avenue Dump site. The attached index identifies the items which comprise the administrative record upon which the selection of the remedial action is based.

The State of Indiana concurs with the selected remedy.

This interim remedial action is the first of two operable units for the site. This operable unit addresses the principal environmental threat at the site, an oil layer floating on the groundwater and seeping into wetlands areas.

The function of this operable unit is to extract and store free-flowing oil and contain remaining oil with a slurry wall. The second operable unit will address treatment of the extracted oil, as well as remediation of waste, soil and groundwater contamination.

The major components of the selected remedy include:

- Constructing a soil - bentonite slurry wall to completely surround the oil layer;
- Installing an oil/groundwater extraction and groundwater recharge system;
- Installing a small scale on-site groundwater treatment system to allow for dewatering of the slurry wall;

- o Monitoring groundwater inside and outside the slurry wall to ensure its effectiveness; and
- o Installing an on-site oil storage tank.

The selected remedy is protective of human health and the environment and is cost-effective. This action attains Federal and State requirements that are applicable, or relevant and appropriate, to this action, and a waiver can be justified for those requirements beyond the scope of this action. Because treatment of the principal threats at the site was not found to be practicable within the limited scope of this operable unit, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The second operable unit will address treatment of the extracted oil and will consider the statutory preference for treatment.

September 20th, 1988
Date

Valdas V. Adamkus
Regional Administrator
Region V

ADMINISTRATIVE RECORD INDEX

9TH. AVENUE DUMP, INDIANA

TITLE	AUTHOR	DATE	PAGES
Results from VIAR analyses of samples.	Robert Gnaedinger	81/03/13	20
Sample results from Midco I	Region V TAT to Beverly Kush	82/06/02	17
Preliminary Assessment Ninth Avenue Dump	DMueller - Ecology & Envrnmt	83/02/02	5
Site Inspection Report	EPA	83/08/08	14
US v. Martell, et al. Consent Judgment	US Dist Ct, NW Dist of Ind.	83/09/29	20
Public Meeting Agenda	USEPA Region V	84/12/12	5
Recommendation of placement of monitoring wells	JStrecker Ind St Bd. of Health	85/02/05	1
An Inventory of the Groundwater Use in the Vicinity of Midco I, Gary, IN	Geosciences Research Assoc.	86/04/00	351
RI/FS Phase I Work Plan	Warzyn Engr. Inc.	86/04/00	303
Final Community Relations Plan	Camp, Dresser, & McKee Inc.	86/07/00	26
Public Meeting of 8/13/80	USEPA Region V	86/08/13	1
Superfund Program Fact Sheet	USEPA Region V	86/08/00	4
EPA Environmental News Release	USEPA Region V	86/08/04	2
Summary of analytical results from resampling wells near Midco I and Midco II, Gary, IN, in July-August 1986	R. Boice-USEPA RPM	86/11/00	23
QAPP	Warzyn Engr. Inc.	86/09/24	492
Memo re groundwater classifications	CHSutfin - EPA	87/01/21	3
RI/FS 9th Avenue Phase II Work Plan, Supplemental Work Plan and Associated Plans.	Warzyn Engineering Co.	87/05/00	433

UPDATE
ADMINISTRATIVE RECORD INDEX
NINTH AVENUE DUMP SITE
GARY, INDIANA

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
1		88/03/29	Record of phone conv. with Arthur Carter of IDEM who added to the list of Indiana ARARs the VOC Emmissions Regulations 1325 IAC, 8-1.1-2 and 8-1.1-6 to be added to the list provided in the 2/26/88 letter.	Allison Miltner-USEPA		Communication Record
2		85/05/31	Letter requesting reclassification of the Nintne Avenue Dump Site.	Woodrow Myers, Jr.-ISBH	Valdas Adamkus-USEPA	Correspondence
2		87/04/30	Letter reflecting the status of Steve Martell's performance of the requirements of the Partial Consent Judgement and his obligations under the same.	Gordan Stoner-U.S.Dept. of Justice	A.Tigne-Cotsirilos&Crowle	Correspondence
2		87/09/24	Letter to resident enlosing the results of well water tests from his home.	Otis Welch	Allison Miltner-USEPA	Correspondence
2		87/10/05	Notification that a prompt remedial action appears necessary.	Dennis Iverson-Warzyn Engineering	Janet Wace-U.S.Army COE	Correspondence
8		88/02/26	State of Indiana's Applicable or Relevant and Appropriate Requirements (ARARs).	Nancy Maloley-in.Dept.ofEnvir.Mgmt.	Valdas Adamkus-USEPA	Correspondence
9		88/03/09	General Notice Letter And Information Request	Mary Gade-USEPA		Correspondence
8		88/04/06	Letter to resident enclosing results of analyses of soil samples taken from her yard.	Allison Miltner-USEPA	Ms. Mildred Kinley	Correspondence
12		00/00/00	Ninthn Avenue Dump Proposed Plan.	USEPA		Fact Sheet
2		88/00/00	Fact Sheet	Gasior & Miltner - USEPA		Fact Sheet
2		85/03/22	Recommendation that the site	Richard Boice-USEPA	Norm Niedergang-USEPA	Memorandum

UPDATE
ADMINISTRATIVE RECORD INDEX
NINTH AVENUE DUMP SITE
GARY, INDIANA

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
- -			be redesignated as a category 1 site d an explanation of why acceptable implementaion of an RI/FS and remedial actions is very unlikely to be obtained through responsible party actions.			
	1	87/08/24	Review of residential well samples dated 6/12/87.	Loise Fabinski-ATSDR	Allison Hiltner-USEPA	Memorandum
	7	87/09/10	ACTION MEMORANDUM: Removal Request for the Ninth Avenue Dump Site, Gary, Indiana.	Sherry Kamke - USEPA	Valdas Adamkus - USEPA	Memorandum
	21	88/03/07	List of individuals receiving notice/information requests.	USEPA		Other
	8	80/08/26	Complaint in the case of United States v. Steve Martell, et al., #H80-473, U.S.D.C., No. Dist. of Indiana-Hammond Div.	Barbara Magel-USEPA, et al.	Steve Martell, et al.	Pleadings/Orders
	21	84/08/08	Order for entry of Partial Consent Decree be entered as of December7, 1983 and that it be further that defendants Irvin Clark, Donald Clark, Charles O. Clark, Bernice J. Clark, Homer Clark and Dorotny Clark be dismissec with prejudice with Partial Consent Decree attached in the case of United States v. Steve Martell, et al., #H80-473, U.S.D.C., No. Dist. of Indiana-Hammond Div.	Judge James T. Moody		Pleadings/Orders
	26	83/07/26	Hazard Ranking System Scoring Package	Roy-ISBH	Beverly Kush - USEPA	Reports/Studies
	5	83/02/02	Preliminary Assessment	Don Mueller-Ecol. & Envir.	USEPA file	Reports/Studies
	14	83/08/08	Site Inspection Report	Lisa Peremchio-Ecol. & Envir.	USEPA	Reports/Studies

UPDATE
ADMINISTRATIVE RECORD INDEX
NINTH AVENUE DUMP SITE
GARY, INDIANA

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
-16		85/09/00	Management Plan Ninth Avenue Dump Site.	U.S.Army Corps of Engineers-Omaha	USEPA	Reports/Studies
293		87/12/00	Remedial Investigation Of Midwest Solvent Recovery, Inc. (Midco I) Gary, Indiana: Public Comment Draft - Appendices J Through P.	Geosciences and ERM	Midco Trustees	Reports/Studies
324		87/12/00	Remedial Investigation Of Midwest Solvent Recovery, Inc. (Midco I) Gary, Indiana: Public Comment Draft- Appendices G Through I.	Geosciences and ERM	Midco Trustees	Reports/Studies
404		87/12/00	Remedial Investigation Of Midwest Solvent Recovery, Inc. (Midco I) Gary, Indiana: Public Comment Draft-Appendices A Through F.	Geosciences and ERM	Midco Trustees	Reports/Studies
448		87/12/00	Remedial Investigation Of Midwest Solvent Recovery, Inc. (Midco I) Gary, Indiana - Public Comment Draft	Geosciences and ERM	Midco Trustees	Reports/Studies
166		87/12/16	Request for Applicable, or Relevant and Appropriate Requirements (ARAR).	D. Iverson - Warzyn Engineering	S.Zebrowski-Corps of Eng.	Reports/Studies
171		88/01/00	Addendum No. 2 Quality Assurance Project Plan (QAPP).	Warzyn Engineering	USEPA	Reports/Studies
374		88/01/13	Technical Memorandum: Ground water use inventory northeast of Midco I.	Robert Aten-Geosciences Research	R.Bail-ERM North Central	Reports/Studies
330		88/03/13	Work Plan for Laboratory Treatability Testing Plan.	Greg Asbury-Warzyn Engineering	S.Zebrowski-Corps of Eng.	Reports/Studies
87		88/05/03	Work Plan for Materials Compatibility Testing	Greg Asbury-Warzyn Engineering	A.Hiltner-USEPA	Reports/Studies

UPDATE
ADMINISTRATIVE RECORD INDEX
NINTH AVENUE DUMP SITE
GARY, INDIANA

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
169		88/06/00	Phased Review Draft - Phased Feasability Study Ninth Avenue Dump RI/FS, Gary, Indiana.	Warzyn Engineering Inc.	COE for the USEPA	Reports/Studies
225		88/06/00	Public Review Draft - Remedial Investigation Report Ninth Avenue Dump RI/FS Gary, Indiana: Volume 2 Tables And Figures.	Warzyn Engineering, Inc.	COE for the USEPA	Reports/Studies
306		88/06/00	Public Review Draft - Remedial Investigation Report Ninth Avenue Dump RI/FS Gary, Indiana: Volume 1.	Warzyn Engineering, Inc.	COE for the USEPA	Reports/Studies
366		88/06/00	Public Review Draft - Remedial Investigation Report Ninth Avenue Dump RI/FS Gary, Indiana: Volume 3 Appendix Part 1.	Warzyn Engineering, Inc.	COE for the USEPA	Reports/Studies
565		88/06/00	Public Review Draft - Remedial Investigation Report Ninth Avenue RI/FS Gary, Indiana: Volume 4 Appendix Part 2.	Warzyn Engineering, Inc.	COE for the USEPA	Reports/Studies

UPS 14560743643

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
NANCY A. MALOLEY, Commissioner

105 South Meridian Street
P.O. Box 6015
Indianapolis 46206-6015
Telephone 317-232-8603

September 19, 1988

O: WMD
CC: RF
BECK

Mr. Valdus V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency
Region V
230 S. Dearborn
Chicago, IL 60604

Re: Record of Decision
Ninth Avenue Dump
Gary, Indiana

Dear Mr. Adamkus:

The Department of Environmental Management (DEM) has reviewed the U.S. Environmental Protection Agency's draft Record of Decision. The DEM is in full concurrence with the selected interim remedy which includes:

- Constructing a soil bentonite slurry wall completely surrounding the site to contain the hydrocarbon layer;
- Installing a hydrocarbon/groundwater extraction and separation unit with oil recovery;
- Installing an on-site groundwater reinjection system;
- Monitoring groundwater inside and outside the slurry wall to ensure its effectiveness; and
- Installing an on-site oil storage tank.

We agree that this action attains Federal and State requirements that are applicable, or relevant and appropriate to this interim remedy. Because treatment of the principle threats at this site is not practicable within the limited scope of this operable unit, this remedy does not fully satisfy the statutory preference for treatment as a principle element of the remedy. The second operable unit will address treatment of the extracted hydrocarbons and offer all other needed recommendations for full site remedy.

DEM staff has been working closely with Region V staff in the selection of an appropriate interim site remedy at Ninth Avenue Dump and is satisfied the selected alternative adequately addresses the highest concentrations of contaminants.

Please be assured that DEM is committed to accomplish cleanup of all Indiana sites on the NPL and intends to fulfill all obligations required by law to achieve that goal.

Sincerely,

Nancy A. Maloley

Nancy A. Maloley
Commissioner

cc: Larry Kane, OLC

RECORD OF DECISION SUMMARY
NINTH AVENUE DUMP

I. SITE NAME, LOCATION AND DESCRIPTION

Ninth Avenue Dump is an inactive chemical and industrial waste disposal site located at 7537 Ninth Avenue in Gary, Indiana (see Figure 1). The site is a seventeen acre parcel in an area of mixed industrial, commercial, and residential use approximately 1/8 mile east of Cline Avenue.

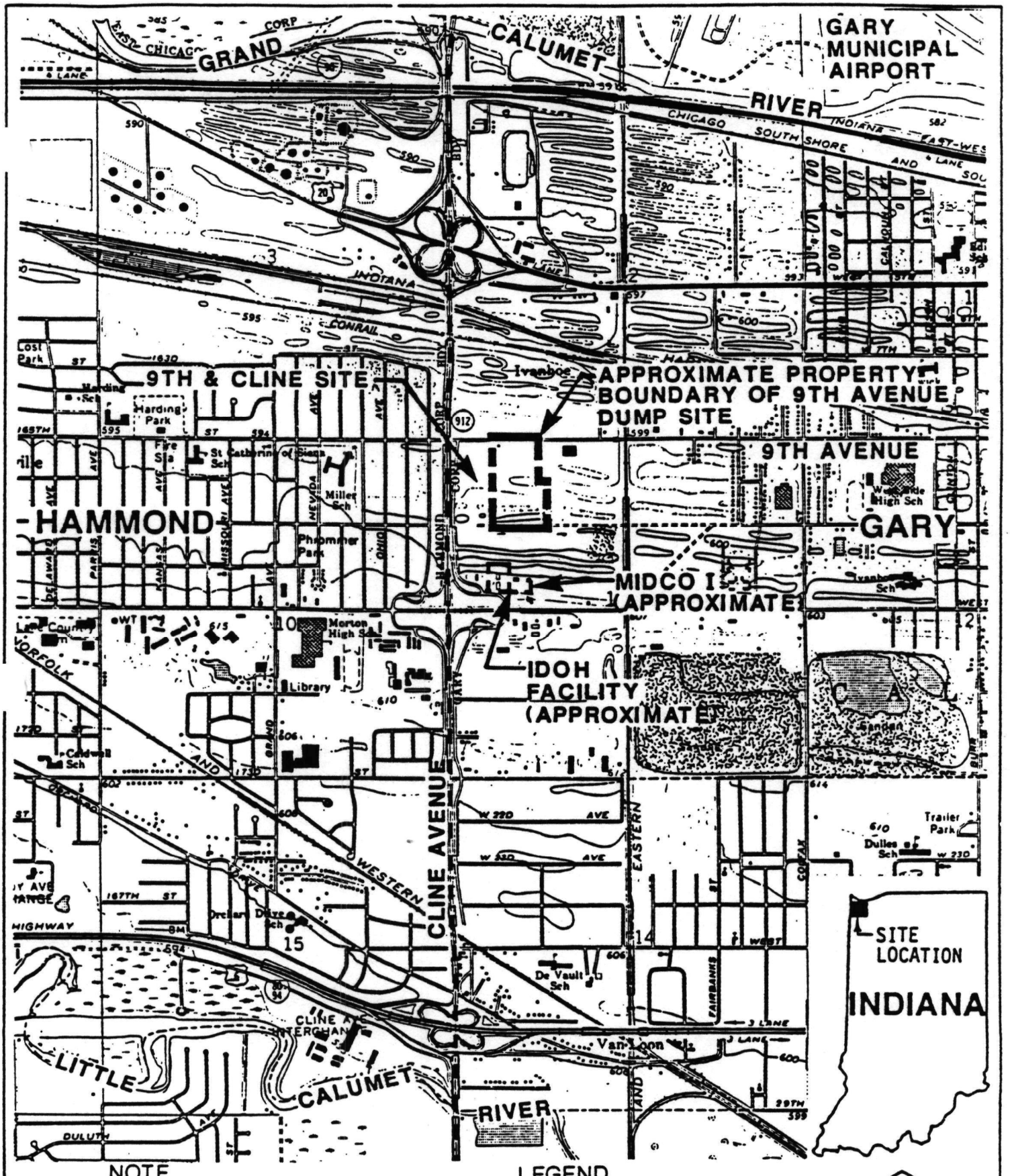
Immediately surrounding the site are vacant, privately owned properties. The property to the west is a lot where hazardous wastes were allegedly buried. This property, referred to as the Ninth and Cline site, was scored but not placed on the National Priorities List (NPL). Approximately 1/4 mile south of the site is an NPL site, MIDCO I, and an Indiana Department of Highways (IDOH) maintenance facility. A Remedial Investigation/Feasibility Study (RI/FS) is ongoing at MIDCO I.

The nearest residential area is approximately 1/8 mile west of the site, on the west side of Cline Avenue. The site is approximately 1 1/4 mile south of the Grand Calumet River and 1 3/4 mile north of the Little Calumet River.

Ninth Avenue Dump is located in a low-lying area with poor drainage. Prior to filling, the site consisted of parallel ridges separated by wetlands areas. Currently, the site is relatively flat with small depressions and mounds remaining from waste disposal or cleanup activities. Interconnected ponds surround waste disposal areas in the north, west and south. Figure 2 is a map showing existing site conditions. The only structures currently on the site are a fence surrounding the contaminated area and a fenced decontamination area including two 5,000 gallon water storage tanks built during the RI/FS.

I. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Hazardous waste disposal occurred at the site from the early to mid 1970s, with some filling, believed to be associated with cleanup activities, continuing until 1980. The site operator accepted dry industrial, construction and demolition waste such as ashes, broken concrete, bricks, trees, wood, tires, cardboard, paper and car batteries. The site also received liquid industrial waste including oil, paint solvents and sludges, resins, acids and other chemical wastes including flammable, caustic and arsenic - contaminated materials. A small-scale auto wrecking operation had reportedly been observed at the property.



NOTE

SITE LOCATION MAP WAS REPRODUCED FROM THE U.S.G.S. 7.5 MINUTE QUAD. MAP, HIGHLAND, INDIANA, 1968, PHOTO REVISED 1980. REFER TO STANDARD U.S.G.S. TOPOGRAPHIC MAP SYMBOLS.

LEGEND

APPROXIMATE PROPERTY BOUNDARY

north

SCALE: 1" = 2000'

FIGURE 1

DWN SJP	APP'D JAH	DATE 6-9-88	C12912-A5

WARZYN

SITE LOCATION MAP

REMEDIAL INVESTIGATION
9TH AVENUE DUMP SUPERFUND SITE
PART OF NW 1/4 OF SECTION 11, T36N, R9W
CITY OF GARY, LAKE COUNTY, INDIANA

TELEDYNE POST 46718

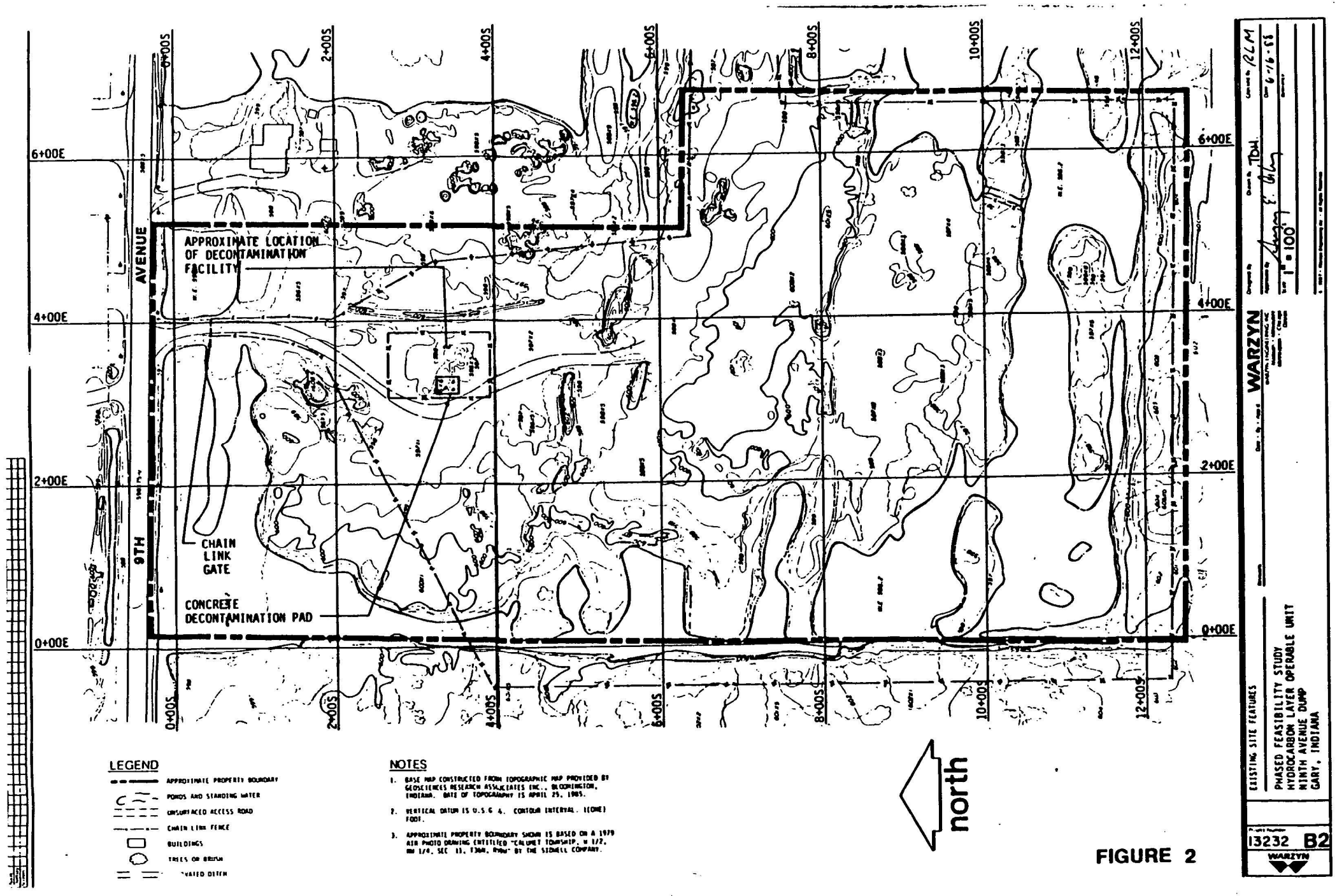


FIGURE 2

EXISTING SITE FEATURES

PHASED FEASIBILITY STUDY
HYDROCARBON LAYER OPERABLE UNIT
NINTH AVENUE DUMP
GARY, INDIANA

WARZYN

Drawn: TDH. Date: 6/16/88
Checked: RCM
Designed:
Approved:
Scale: 1" = 100'

13232 B2

In 1975, the Indiana State Board of Health (ISBH) inspected the site. The inspection documented the existence of approximately 10,000 55-gallon drums at the surface, many of which were empty. Evidence was also found that liquid wastes had been dumped on-site. A State inspector estimated that approximately 500,000 gallons of liquid industrial waste had been dumped and 1,000 drums had been buried on-site. Subsequent inspections revealed portions of discarded auto batteries, drummed liquid wastes and abandoned tanker trucks.

In 1975 and 1980, the site operator, Mr. Steve Martell, was ordered by ISBH and the United States Environmental Protection Agency (EPA), respectively, to initiate surface cleanups. Subsequently, he removed some barrels, junk cars and trucks from the site. In 1983, the site was placed on the National Priorities List and a Partial Consent Judgement was signed between EPA and Mr. Martell. The Consent Judgement required Mr. Martell to evaluate surface and subsurface conditions and submit a plan for remedial action.

In early 1985, when Mr. Martell appeared to have insufficient funds to perform these tasks, EPA took over performance of the RI/FS.

In early 1988, Mr. Martell provided information on generators at the Ninth Avenue site. Based on this information, General Notice Letters were sent to approximately 240 potentially responsible parties (PRPs) on March 9, 1988. Special Notice Letters for performance of remedial design/remedial action (RD/RA) were sent to approximately 170 PRPs on July 9, 1988. The deadline for receipt of a "good faith proposal" from the PRPs is September 13, 1988.

III. COMMUNITY RELATIONS HISTORY

Public meetings have been held on August 13, 1986 and July 13, 1988 to discuss RI/FS activities. The proposed plan and administrative record were made available to the public on July 5, 1988, which marked the start of a 30-day public comment period. Public comments and responses to those comments are contained in the Responsiveness Summary (Appendix A).

IV. SCOPE AND ROLE OF OPERABLE UNIT

This operable unit addresses remediation of an oil layer floating on the groundwater surface. It is the first of two operable units, the second of which will address buried waste, contaminated soils, and contaminated groundwater.

Remediation of the oil layer will address the principal environmental threat at the site. Several organic and inorganic contaminants have been detected in the oil in higher concentrations than in other media. The oil is thought to be the principal source of groundwater contamination. Oil seeps have been seen in on-site ponds leading to concerns that the oil may be affecting aquatic life, and may pose a direct contact threat to trespassers.

This action is compatible with alternatives under consideration for final remediation of the site. The proposed slurry wall will encircle waste areas and contaminated groundwater as well as the oil layer, and will make it easier to excavate waste under the water table if required under the final remedy.

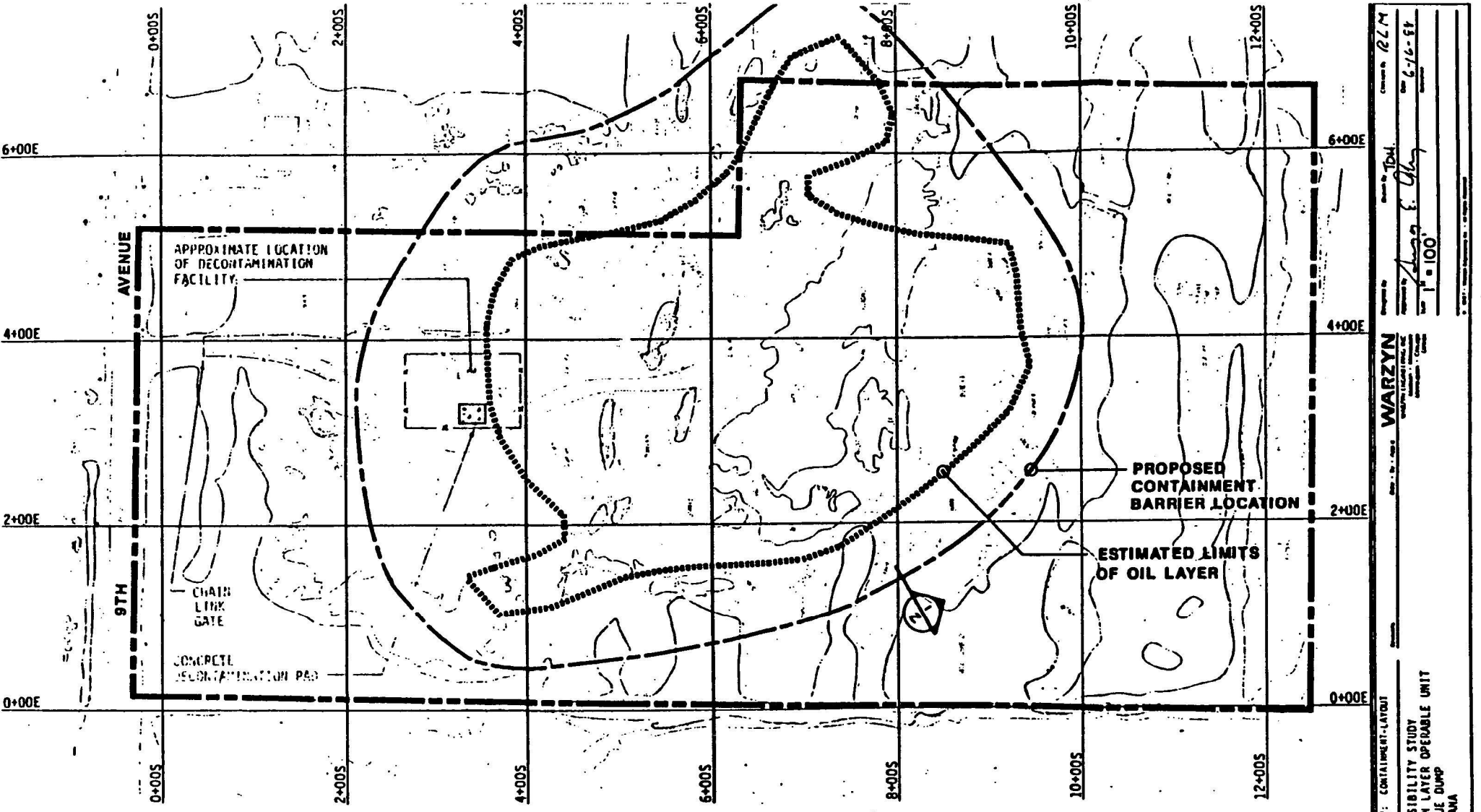
V. SITE CHARACTERISTICS

The oil layer is floating on the groundwater surface approximately five feet below the ground. Oil layer thickness varies from 0.25 to 3.8 feet as measured in five on-site monitoring wells. The lateral extent of the oil layer covers approximately 30 to 50 percent of the site area and encompasses the central and south central portions of the site (see Figure 3). The quantity of oil under the site is estimated at 250,000 to 700,000 gallons, of which 100,000 to 500,000 gallons is estimated to be recoverable.

Analyses of floating oil layer samples indicate the presence of benzene, ethylbenzene, toluene, xylene, chlorinated hydrocarbons, and polynuclear aromatic hydrocarbons (PAHs). Metals and cyanides were also detected. Polychlorinated biphenyls (PCBs) have also been detected up to a maximum concentration of 1500 ppm. Analytical results are summarized in Table 1.

Five oil samples were collected in February 1988 and were analyzed for chlorinated dibenzodioxins (CDD) and dibenzofurans (CDF). Results indicate that hepta- and octa-CDD were present in all samples, in concentrations ranging from 5.3 to 437 ppb. Most samples contained low levels of CDF compounds in concentrations ranging from 3.4 to 15.8 ppb.

The location of the oil layer roughly coincides with the waste disposal area in the southern portion of the site, but it has migrated to the north, in the direction of groundwater flow. Comparison of logs of test pit excavations conducted in 1984 by Andrews Engineering with those conducted in 1986 by Warzyn Engineering shows that the oil layer has spread to the north and east between 1984 and 1986. Except for a small area to the east, the oil layer appears to be confined to the site at this time.



LEGEND

- ESTIMATED LIMITS OF OIL LAYER
- PROPOSED CONTAINMENT BARRIER LOCATION

NOTES

1. REFER TO DRAWING 13232-02 FOR ADDITIONAL NOTES AND LEGEND
2. REFER TO FIGURE 3, SHEET 2 FOR BARRIER SECTION DETAIL.

FIGURE 3

ALTERNATIVE 2: CONTAINMENT-LAYOUT

PHASED FEASIBILITY STUDY
HYDROCARBON LAYER OPERABLE UNIT
NINTH AVENUE DUMP
GARY, INDIANA

WARZYN

1" = 100'

13232 B3

TABLE 1

RISK EVALUATION DATA

COMPARISON OF ROUND 2 HYDROCARBON LAYER RESULTS TO SURFACE WATER, SEDIMENT AND GROUNDWATER, AND SELECTED AVAILABLE CRITERIA AND TOXICITY INDICES

NINTH AVENUE DUMP, GARY, INDIANA

	HYDROCARBON LAYER (ug/kg)			SURFACE WATER CONCENTRATION (ug/L)			SEDIMENT CONCENTRATION[1] (ug/kg)			GROUNDWATER CONCENTRATION (ug/L)		
Chemical	FD[2] (t=6)	Maximum	Mean	FD[2] (t=14)	Maximum	Mean	FD[2] (t=20)	Maximum	Mean	FD[2] (t=74)	Maximum	Mean
VOLATILES												
1,1-Dichloroethane	1	160,000	160,000	1	2	2	1	23	23	17	2,400	187
Trans-1,2-dichloroethene	6	940,000	64,539	1	4	4				16	49,000	1,026
2-Butanone	1	16,000	16,000							25	2,100,000	4,659
1,1,1-Trichloroethane	1	1,000,000	1,000,000							7	2,800	180
Benzene	3	390,000	290,560							28	16,000	109
4-Methyl-2-pentanone	3	540,000	87,533							2	630	172
Tetrachloroethene	1	120,000	120,000							2	130	11
Toluene	6	15,000,000	1,108,573				11	1,900	156	35	90,000	768
Ethylbenzene	6	8,800,000	421,908							26	6,900	1,003
Styrene	1	530,000	530,000									
Total Xylenes	6	63,000,000	1,918,905	1	5	5				23	39,000	3,353
SEMI-VOLATILES												
1,2-Dichlorobenzene	2	52,000	50,990									
4-Methylphenol	1	5,700	5,700				1	640	640	16	11,000	380
Naphthalene	4	3,700,000	368,039							22	77,000	158
4-Chloroaniline	1	220,000	220,000									
2-Methylnaphthalene	6	11,000,000	424,604							20	220,000	129
Acenaphthylene	2	500,000	463,681							2	1,600	80
Acenaphthene	1	550,000	550,000	1	2	2				11	13,000	43
Dibenzofuran	2	630,000	404,722							6	52	16
Fluorene	3	1,000,000	255,300							10	20,000	46
N-nitrosodiphenylamine	4	35,000	15,751									
Phenanthrene	4	3,300,000	433,930				5	4,300	1,105	18	56,000	54
Anthracene	2	1,600,000	669,328				1	1,500	1,500	13	5,700	18
Di-n-butylphthalate	3	51,000	48,952				4	730	515	6	16	7
Fluoranthene	4	960,000	101,186				6	4,300	1,123	8	12,000	103
Pyrene	4	500,000	75,936	1	9	9	6	3,700	1,376	12	8,900	26
Benzo(a)anthracene	2	240,000	132,363				1	1,900	1,900	4	1,200	57
Bis(2-ethylhexyl)phthalate	4	520,000	297,975	7	4	3	14	25,000	3,601	23	86	9
Chrysene	3	230,000	85,631				5	2,300	1,188	5	3,100	115
Di-n-octylphthalate	1	54,000	54,000				4	17,000	2,608	13	62	9
Benzo(b)fluoranthene	2	180,000	140,712				4	2,400	1,070	2	890	171
Benzo(a)pyrene	2	210,000	122,963				2	2,700	1,488	2	970	143
Indeno(1,2,3-cd)pyrene	2	160,000	78,994				2	1,500	693	1	7	7
Dibenz(a,h)anthracene	1	42,000	42,000				1	290	290	1	4	4
Benzo(g,h,i)perylene	2	170,000	72,595				1	1,400	1,400	3	610	34
Aroclor 1248	4	1,500,000	61,799									
Aroclor 1254	2	79,600	21,854				2	7,400	1,720			
Aroclor 1260	2	5,700	5,392									
METALS												
Aluminum	1	410	410	8	551	234	20	33,852	3,773	17	1,290	249
Cadmium	1	17	17	2	6.3	5				19	20	8
Calcium	1	1,560	1,560	14	219,000	70,619	20	121,250	13,481	74	1,060,000	260,976
Chromium	7	920	156	8	55	10				48	558	23
Iron	2	514	350	14	16,100	1,399	20	64,593	9,553	69	178,000	7,764
Nickel	2	70	57	8	114	32				55	12,500	121
Silver	1	66	66	6	570	103				20	100	38
Zinc	3	543	189	11	106	59	20	790	260	73	23,300	1,110

Chemical	POSSIBLE CHEMICAL-SPECIFIC ARARs: RCRA MCL[3] (mg/L)	SDWA MCL[4] (mg/L)	CWA AWQC[5] (freshwater) acute (mg/L)	chronic (mg/L)	SELECTED TOXICITY INDICES FOR AQUATIC SPECIES (Source: Verschueren, 1983) Species	Index
VOLATILES						
1,1-Dichloroethane					Pinperch	TL_m(24 hr): 160 mg/L
Trans-1,2-dichloroethene						
2-Butanone					Bluegill	TL_m(24-96 hr): 5640-1690 mg/L
1,1,1-Trichloroethane		0.2			Fathead Minnow	96 hr LC_{50}: 52.8 mg/L
Benzene		0.005	5.3		Bluegill	24-48 hr LD_{50}: 20 mg/L
4-Methyl-2-pentanone					Goldfish	24 hr LD_{50}: 460 mg/L
Tetrachloroethene			5.2	0.84	Fathead Minnow	96 hr LC_{50}: 18.4 mg/L
Toluene			17		Bass	96 hr LC_{50}: 7.3 ppm
Ethylbenzene			32		Bluegill	TL_m(25-96 hr): 35.1-32.0 mg/L
Styrene					Bluegill	TL_m(96 hr): 25.1 mg/L
Total Xylenes					Rainbow Trout	96 hr LC_{50}: 13.5 mg/L
SEMI-VOLATILES						
1,2-Dichlorobenzene						
4-Methylphenol					Carp	24 hr LC_{50}: 21 mg/L
Naphthalene					Mosquito Fish	24-96 hr TL_m: 220-150 mg/L
4-Chloroaniline						
2-Methylnaphthalene					Brown Trout	48 hr LC_{50}: 8.4 mg/L
Acenaphthylene						
Acenaphthene			1.7	0.5		
Dibenzofuran						
Fluorene						
N-nitrosodiphenylamine						
Phenanthrene						
Anthracene					Trout	no effect level - 5 mg/L, 24 hr
Di-n-butylphthalate			0.94	0.003		
Fluoranthene			3.9			
Pyrene					Mosquito Fish	24 hr TL_m: 2.6 ug/L
Benzo(a)anthracene						
Bis(2-ethylhexyl)phthalate						
Chrysene						
Di-n-octylphthalate						
Benzo(b)fluoranthene						
Benzo(a)pyrene						
Indeno(1,2,3-cd)pyrene						
Dibenz(a,h)anthracene						
Benzo(g,h,i)perylene					Bluegill	96 hr TL_m: 78 ug/L
Aroclor 1248			0.002	0.000014	Bluegill	30 day LC_{50}: 0.075 mg/L
Aroclor 1254			0.002	0.000014	Bluegill	30 day LC_{50}: 0.177 mg/L
Aroclor 1260						
METALS						
Aluminum						
Cadmium	0.01	0.01	0.0039	0.0011		
Calcium						
Chromium	0.05	0.05	0.016	0.011		
Iron						
Nickel	0.013		1.8	0.096		
Silver	0.05	0.05	0.0041	0.00012		
Zinc			0.32	0.047		

NOTES

(1) Sediment samples were only collected during Round 1.

(2) FD - Frequency of detection.

(3) Resource Conservation and Recovery Act Maximum Contaminant Level. 40 CFR 257. Used to indicate release to groundwater from regulated sold waste management units. MCLs must be met at facility boundary, in general.

(4) Safe Drinking Water Act Maximum Contaminant Level. 40 CFR 141. For protection of human health. Concentration limits apply to public and community water supplies.

(5) Clean Water Act Ambient Water Quality Criteria. For protection of aquatic life. Levels are established based on evidence of toxic effects to organisms. These are non-enforceable numbers, typically used to establish limits for discharges to surface water.

ppm part per million

LC_{50} (lethal concentration fifty) a calculated concentration which, when administered by the respiratory route, is expected to kill 50% of the population of experimental animals. Ambient concentration is expressed in milligrams per liter.

LD_{50} (lethal dose fifty) a calculated dose of a chemical substance which is expected to kill 50% of a population of experimental animals exposed through a route other than respiration. Dose concentration is expressed in milligrams per kilogram of body weight.

TL_m (median tolerance limit) this term has been accepted by most biologists to designate the concentration of toxicant or substance at which 50% of the test organisms survive.

13232.12
KJD/sss/SGW
[kam-400-64]

The oil layer appears to be a major source of groundwater contamination. The groundwater under the site is contaminated with approximately 100 organic and inorganic compounds, including many of the compounds found in the oil layer (see Table 1).

The shallow aquifer under the site is part of the Calumet Aquifer, which consists of 30 feet of coarse sand and extends from the Little Calumet River to Lake Michigan. This is underlain by a 90 - 100 foot clay aquiclude. At the site, groundwater is typically found within five feet of the surface. Groundwater flow velocities are very slow, ranging from 0.27 ft/day at the southern portion of the site to 0.02 ft/day near Ninth Avenue. Groundwater flow is generally to the north, with ponds at the northwest and northeast corners acting as local groundwater discharge areas. Because of the low gradients, groundwater contamination has not, for the most part, migrated beyond the site boundaries.

Groundwater contamination on-site is complicated by a plume of high dissolved solids at the bottom of the aquifer from an off-site source. Chloride concentrations were as high as 16,000 ppm immediately upgradient (south) of the site and decreased to approximately 100 ppm to the north of the site. Based on this finding, a limited off-site groundwater investigation was done at the IDOH facility to the south of the site, where chloride concentrations as high as 46,000 ppm were found.

Surface water samples showed that Ambient Water Quality Criteria (AWQC) were exceeded for some metals and pesticides in a few locations around the site (see Table 1). Oil seeps have been observed in a small pond on the west side of the site, and an oil sheen has been noted on several surface water bodies. This suggests that failure to remediate the oil layer may lead to future degradation of surface water quality.

VI. SUMMARY OF SITE RISKS

The oil layer is releasing contaminants to the environment through the following pathways: volatilization of contaminants through the soil cover to the air; release of materials to the groundwater; and discharge of oil to surface water. These releases provide potential for exposure to humans as well as terrestrial and aquatic life.

Potential risks due to inhalation of volatiles and drinking and nondrinking uses of groundwater were evaluated in the Endangerment Assessment and are summarized in Table 2. Inhalation of volatiles by trespassers resulted in a carcinogenic risk exceeding 10^{-6} for the present use scenario, while a future residential use scenario showed a carcinogenic risk exceeding 10^{-5}.

Table 2

NINTH AVENUE DUMP

Human Health Risks due to Hydrocarbon Layer and Groundwater

Medium	Pathway	Carcinogenic Risk *		Noncarcinogenic Risk * (Chronic Hazard Index)	
		peak	mean	peak	mean
Current Use					
Hydrocarbon Layer	Inhalation	5.9×10^{-6}	3.2×10^{-6}	<.01	<.01
Future Use (Residential)					
Hydrocarbon layer	Inhalation	5.2×10^{-5}	3.2×10^{-5}	0.04	0.01
Groundwater	Ingestion	1.7	1.6×10^{-1}	2998	62
Groundwater	Dermal	1.6	1.6×10^{-1}	29.2	1
Groundwater	Inhalation	2×10^{-2}	2.1×10^{-4}	1.8	-

* Risk calculations are based on the following indicator chemicals: Benzene, toluene, trichloroethylene, cresols, PAHs, bis (2-ethylhexyl)phthalate, heptachlor, PCBs, nickel, lead, salt.

There is currently no exposure to groundwater contaminants because of the limited migration of the contaminant plume, and because there is little use of the aquifer. Under a residential future use scenario, carcinogenic risk due to ingestion or dermal absorbtion (through showering) of groundwater exceeds 1.

Potential for exposure through surface water seeps was not evaluated in the Endangerment Assessment because analytical data for oil at seep locations was not available. Based on the high contaminant concentrations in the oil, direct contact with the oil at a seep poses a potentially significant exposure route. Aquatic and terrestrial wildlife are the most likely receptors. A comparison of concentrations of contaminants in the oil layer to AWQC for the protection of aquatic life indicates that contact with even small quantities of oil would be harmful to aquatic life (see Table 1).

VII. DESCRIPTION OF ALTERNATIVES

Four alternatives were developed to meet the response objective of minimizing the environmental and human health threat posed by the hydrocarbon layer and associated hazardous constituents. These include no action, containment, oil extraction, and oil extraction with containment, as described below.

Alternative 1: No Action

Under this alternative, action to prevent further degradation of groundwater and surface water by the oil layer would be delayed until implementation of the final remedial action. Further migration of the oil layer would result in increased contamination of these media and may escalate the cost of final remedial action.

Total Cost: none
Time to Implement none

Alternative 2: Containment

Under this alternative, a soil-bentonite slurry wall would be constructed to completely surround the oil layer. (see Figure 3). It would extend from the ground surface to 30 feet below the surface, where it would key into the natural clay confining layer. The wall would prevent migration of the oil layer and further contamination of groundwater and surface water. Construction of the wall would require filling of areas where seeps have been seen, thereby preventing contact with existing seep areas. After construction, groundwater levels and water quality would be checked periodically via monitoring wells on either side of the wall. A pumping system would be used to prevent buildup of water within the wall. An average flow rate of less than one gallon per minute (gpm) should be adequate to compensate for infiltration inside the wall.

Pumped groundwater would be stored in an on-site tank, periodically treated and discharged to the aquifer. An on-site treatment system would be used to treat groundwater to the Maximum Contaminant Levels (MCLs) set by the Safe Drinking Water Act, or 10^{-6} carcinogenic risk. Total dissolved solids would not be treated unless background levels were exceeded.

Total Cost (in present net worth (PNW)):	$ 1,730,000
Capital Cost:	$ 1,520,000
Annual Operation and Maintenance (O&M):	$ 83,000
Time to Implement:	1 year

Alternative 3: Oil Extraction

This alternative involves extraction of oil and groundwater via a series of peripheral extraction wells, separation of oil from groundwater, and reinjection of only the groundwater at the center of the oil layer. Although peripheral extraction wells are not as efficient as a central extraction system because oil would be extracted from the thinnest, rather than the thickest, part of the oil layer, they provide more assurance that reinjected contaminated groundwater will not migrate beyond the recapture area. Extracted oil would be stored on-site (Alternative 3A) or incinerated (Alternative 3B).

Operation and maintenance would include monitoring discharge rates and water levels, periodic tank inspections, monitoring oil levels, collection of oil samples for characterization, and general implementation of a spill prevention, countermeasure, and control (SPCC) plan as required under the Resource Conservation and Recovery Act (RCRA).

Alternative 3A utilizes an on-site tank to store the extracted oil. The tank would be constructed and monitored consistent with RCRA and Toxic Substances Control Act (TSCA) requirements. The decision on treatment of the oil would be made after completion of the final Feasibility Study, allowing evaluation of treatment technologies that would address waste and contaminated soils, as well as oil. The extraction system could be constructed in less than one year, but complete extraction of free flowing oil will take 3 years or more to complete.

Total Cost (PNW):	$ 704,000
Capital Cost:	$ 435,000
Annual O and M:	$ 108,000
Time to Implement:	1 year

Alternative 3B consists of collecting extracted oil in an on-site storage tank, then treating it through incineration at a RCRA/TSCA compliant facility. The choice of on-site incineration with a mobile

incinerator or off-site commercial incineration would be determined by availability and cost. Preliminary conversations with incinerator operators indicate it may be difficult to find a commercial incinerator willing to accept oil with low levels of dioxins and furans. The cost estimate below is based on on-site incineration. This alternative would require approximately 3 years to implement, since incineration would not be initiated until a large portion of the oil has been recovered.

Total Cost (PNW):	$ 2,780,000
Capital Cost:	$ 2,400,000
Annual O and M:	$ 153,000
Time to Implement:	3 years

Alternative 4: Containment and Oil Extraction

Alternative 4 is a combination of Alternatives 2 and 3. Oil and contaminated groundwater would be extracted from a series of central extraction wells. Oil would be separated from groundwater and water would be reinjected via a trench located inside a containment wall at the perimeter of the oil layer. Figure 4 is a schematic diagram of this alternative in cross section. Combining a containment barrier with an oil extraction system would allow efficient hydrocarbon extraction and give greater assurance that the reinjected groundwater would not spread the groundwater contamination plume.

As discussed for Alternative 2, the slurry wall would extend 30 feet below the surface to the underlying clay layer. Groundwater levels and water quality would be monitored periodically, and a small quantity of groundwater would be treated and discharged to the aquifer. Approximately one gpm is estimated to be adequate to avoid excessive water buildup inside the slurry wall.

As discussed for Alternative 3, oil storage would be consistent with RCRA and TSCA regulations. Operation and maintenance would be the same as for Alternative 3.

Alternative 4A utilizes an on-site storage tank to store extracted oil. Oil treatment would be evaluated with waste and contaminated soil treatment in the final Feasibility Study. The slurry wall and extraction system could be constructed in one year, but oil extraction will take 3 or more years to complete.

Total Cost (PNW):	$ 2,430,000
Capital Cost:	$ 1,960,000
Annual O and M:	$ 190,000
Time to Implement:	1 year

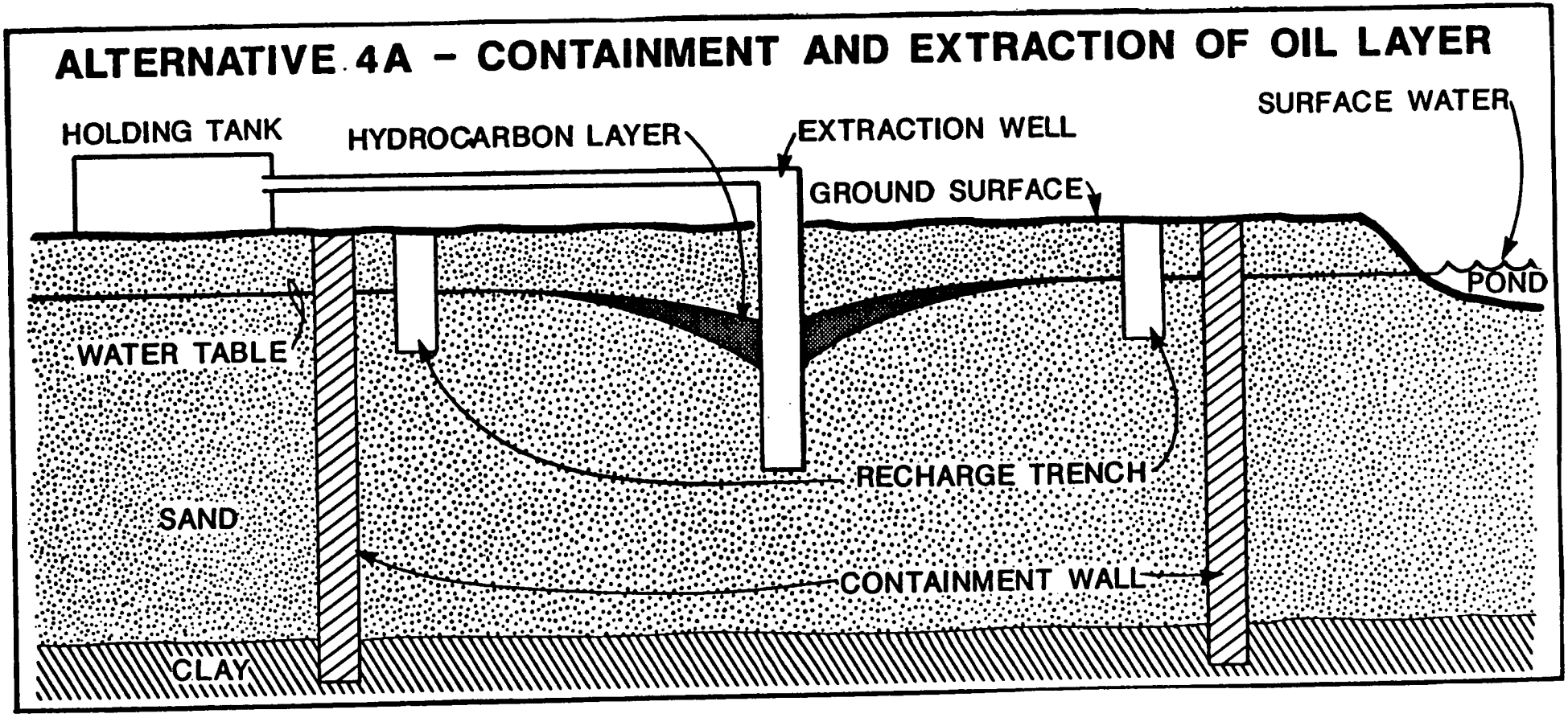

ALTERNATIVE 4A - CONTAINMENT AND EXTRACTION OF OIL LAYER
HOLDING TANK
HYDROCARBON LAYER
EXTRACTION WELL
SURFACE WATER
GROUND SURFACE
POND
WATER TABLE
RECHARGE TRENCH
SAND
CONTAINMENT WALL
CLAY

FIGURE 4

Alternative 4B consists of collecting extracted oil in an on-site storage tank, then treating by incineration. As discussed for Alternative 3B, on- and off-site incineration would be considered. The cost estimate below is based on on-site incineration. This alternative would require approximately 3 years to implement, since incineration would not be initiated until a large portion of the oil has been recovered.

Total Cost (PNW):	$ 4,450,000
Capital Cost:	$ 3,870,000
Annual O and M:	$ 235,000
Time to Implement:	3 years

VIII. SUMMARY OF THE COMPARATIVE ANALYSIS

The nine criteria used by EPA to evaluate remedial alternatives include: overall protection of human health and the environment; compliance with applicable, or relevant and appropriate, requirements (ARARs); long-term effectiveness; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost, state acceptance; and community acceptance. Based on evaluation of the alternatives with respect to the nine criteria, EPA has selected Alternative 4A - Containment, Oil Extraction, and Storage - as the preferred alternative for the Ninth Avenue Dump interim remedy.

Protection of Human Health and the Environment

Alternative 4 is the most protective of the alternatives evaluated. It provides two important functions: 1) it removes much of the free-flowing oil and long-term confinement of the remaining contaminants, and 2) it reduces opportunities for contact by covering existing oil seeps and preventing future seepage into ponds. All alternatives, except No Action, would protect human health and the environment. Alternatives 2 and 4 are considered more protective than Alternative 3, because the containment barrier is considered more reliable in preventing migration of contaminated oil and groundwater than the extraction and recharge system provided in Alternative 3.

Compliance with ARARs

All action alternatives should attain ARARs specific to the oil cleanup. These include: Executive Order 11990 for protection of wetlands; Section 404 of the Clean Water Act, pertaining to dredge and fill activities in wetlands; RCRA Tank, Incinerator, and Transporter requirements; TSCA PCB storage and disposal regulations; Underground Injection Control regulations; National Ambient Air Quality Standards; OSHA hazardous waste safety regulations; Hazardous materials transportation regulations; and Indiana fugitive dust and VOC emissions standards.

Contaminant specific surface water and groundwater ARARs such as MCLs and AWQC would not be met by any alternative due to the limited nature of this operable unit. However, groundwater extracted for the purpose of maintaining water levels inside the slurry wall will be treated to meet MCLs prior to discharge to the aquifer. Similarly, cleanup levels specified in the TSCA PCB spill cleanup policy may not be met because PCB contaminated oil adsorbed to soils would not be addressed under any alternative. All of these ARARs will be addressed in the final Feasibility Study. This will require invoking the interim remedy waiver under Section 121 of SARA.

Long-Term Effectiveness and Permanence

Although Alternative 4A (and 3A) provide only for oil storage, the intent is to provide for easy implementation of permanent destruction of contaminated oil during the final remedy. Alternatives 3B and 4B provide for destruction of the oil. The more efficient extraction system in Alternative 4 is considered more effective because it provides for more oil collection than Alternative 3. Alternative 2 provides only for containment, and Alternative 1 provides no effectiveness.

Reduction in Toxicity, Mobility, or Volume

All action alternatives reduce mobility of the contaminated oil through containment, extraction, or both. Alternatives 3B and 4B provide for treatment technologies which reduce toxicity, mobility, or volume (TMV) of hazardous substances. The intent of Alternatives 3A and 4A is that reduction in TMV would be provided in the final remedy. Alternatives 1 and 2 provide no reduction in TMV through treatment.

Short-Term Effectiveness

All action alternatives are more effective in reducing risks to the local community and the environment than the No Action alternative. Potential effects on the community during implementation of the alternatives would be related to generation of dust or emissions of volatiles during construction, however, the off-site effects should be minimal. All action alternatives may pose some risk to on-site workers, however, conventional personnel protection measures will be adequate to protect on-site workers.

Alternatives 2 and 4 provide the most immediate protection because the containment barrier can be constructed in less than one year. Both of these alternatives will involve some environmental impact, since 0.5 to 1 acre of the wetlands will be filled to construct the slurry wall. The environmental benefit of remediating present and preventing future oil seeps into wetlands is considered to outweigh the impact of filling.

Implementability

Alternative 4A and all other alternatives use conventional and available technologies. Alternative 3 has the greatest technical uncertainty because of reliance on the extraction and recharge system instead of a containment barrier to contain the contaminated groundwater plume. Alternatives 3B and 4B may present some difficult engineering solutions because it may be difficult to find a commercial incinerator willing to accept dioxin contaminated waste, and a mobile incinerator may not be cost-effective for the relatively small quantity of waste to be incinerated.

Alternative 4A is the most compatible with future remedial action at the site. Oil extraction is a necessary component of all final remedy alternatives, except containment. Also, the slurry wall will enclose waste, contaminated soils, and contaminated groundwater, as well as oil. This will simplify implementation of remedial action for these media, since it will allow for groundwater treatment within an enclosed area, and lowering of the water table for soil and waste excavation.

Cost

Alternative 4A, at $ 2,430,000 in total cost, is intermediate in cost. The alternatives involving oil treatment, 3B and 4B, are the most expensive at $ 2,780,000 and $ 4,450,000, respectively. Alternative 2, containment, is intermediate in cost at $ 1,730,000, and Alternative 3A, oil extraction and storage, is the least expensive (other than No Action), at $ 704,000.

State Acceptance

The Indiana Department of Environmental Management (IDEM) has been involved throughout the RI/FS and concurs with Alternative 4A as the selected remedy.

Community Acceptance

Community involvement at the site has been moderate. The primary concerns expressed during the public meeting and in public comments were: a desire to see the remedial action completed quickly, and a preference for permanent destruction, rather than storage, of oil. A complete list of public comments and responses to those comments are provided in Appendix A.

IX. SELECTED REMEDY

As discussed in the previous section, EPA has selected Alternative 4A - Containment, Oil Extraction and Storage - as the most appropriate interim remedy for the Ninth Avenue Dump site. This alternative was

selected because it is the most protective remedy, other than 4B, and it is the most compatible with the final remedial alternatives under consideration. The oil layer is the most highly contaminated medium at the site and is the primary source of groundwater and surface water contamination, thus, oil extraction is a necessary component of all final remedial alternatives, except containment. Since oil extraction will take at least 3 years to complete, early implementation of oil extraction will allow for earlier implementation of other probable components of the final remedy, such as waste excavation. Storage of oil was selected over treatment because of the uncertainties associated with off-site commercial incineration described previously. Also, deferring the decision on oil treatment to the final Feasibility Study allows consideration of technologies and design of a system that will treat both the oil and the waste.

As discussed previously, a containment barrier is also compatible with the final cleanup because it encloses contaminated soils and waste areas and prevents migration of the contaminated groundwater, as well as containing the oil phase. This will ease implementation of remedial action for all of these media. Components of the selected remedy are described below.

Containment: A soil-bentonite slurry wall will be constructed to completely surround the hydrocarbon layer. It will be keyed into the underlying clay layer 30 feet below the surface. Slurry wall construction will require filling 0.5 to 1 acre of wetlands.

Groundwater levels and water quality will be monitored on a periodic basis via monitoring wells on either side of the wall. A small quantity of water (approximately 1 gpm) will be diverted from the extraction and recharge system described below to avoid buildup of water within the slurry wall. This water will be treated with an on-site treatment system to MCLs or 10^{-6} carcinogenic risk. Because salt concentrations upgradient exceed those on-site, total dissolved solids will be treated only if concentrations exceed background levels.

Oil Extraction: Oil and groundwater will be extracted through a series of central extraction wells. A two-pump system will be installed in each well to recover oil and groundwater separately. It is estimated that 100,000 to 500,000 gallons of oil will be recoverable, of which 90,000 to 340,000 gallons would be recoverable in 3 years. The groundwater will be piped to a recharge system consisting of recharge wells connected by shallow gravel filled trenches. Discharge rates and water table elevations will be monitored.

Oil Storage: Oil will be pumped to an on-site storage tank located within a secondary containment structure as required under TSCA regulations. Substantive RCRA and TSCA tank storage requirements will be met.

Operation and maintenance of the tank system will include periodic tank inspections, monitoring oil levels, collecting samples for characterization, periodic removal of rainwater from the tank and implementation of an SPCC plan. Security measures such as maintenance of the fence and frequent inspections will be taken to ensure the tank is not vandalized.

X. STATUTORY DETERMINATIONS

EPA and IDEM believe the selected remedy satisfies the statutory requirements specified in Section 121 of SARA to protect human health and the environment; attain ARARs (or provide grounds for invoking a waiver); utilize permanent solutions and alternate treatment technologies to the maximum extent practicable.

Protection of Human Health and the Environment

The selected remedy, Alternative 4A, provides protection of human health and the environment through extraction of free-flowing contaminated oil. Although this operable unit was primarily intended to address the oil layer, the containment barrier will also encircle and prevent migration of contaminants in waste, soils and groundwater. An assessment of the current and future risks posed by the oil layer is presented in Section VI. The selected remedy will significantly reduce migration of contaminants to surface water and cover existing oil seeps, thereby reducing risks to aquatic life and human receptors.

As discussed in Section VIII, short term impacts to off-site residents during construction are expected to be minimal. The environmental impact of filling a small portion of the on-site ponds is believed to be outweighed by the environmental benefit of preventing degradation of a much larger wetlands area on- and off-site.

Attainment of Applicable, or Relevant and Appropriate Requirements

This action meets Federal and more stringent State ARARs specific to the oil cleanup. Due to the limited nature of the operable unit, chemical specific ARARs for groundwater and surface water will not be addressed, except that groundwater treated and discharged to maintain inward gradients in the slurry wall will meet MCLs. Cleanup levels specified in the TSCA PCB Spill Cleanup Policy may not be met because PCB contaminated oil adsorbed to soils would not be addressed under

this operable unit. SARA Section 121(d)(4)(A) allows for selection of a remedy not meeting ARARs when the remedial action selected is only part of a total remedial action that will attain ARARs when completed. ARARs specific to the selected remedy are listed below.

Chemical Specific ARARs

40 CFR Part 141 (Maximum Contaminant Levels): These are considered relevant and appropriate for water to be treated and discharged to the aquifer outside the slurry wall.

Location Specific ARARs

Executive Order 11990: Applicable to Federal actions in wetlands. Agencies are required to avoid engaging in new construction in a wetland unless there is no practicable alternative.

Fish and Wildlife Coordination Act: Applicable to Federal actions resulting in control or modification of a natural stream or body of water. Regulated activities include potential inadvertent discharges of pollutants.

Clean Water Act (Section 404): A permit is required prior to discharge of dredged or fill material into a wetland, but CERCLA exempts on-site actions from permit requirements. Discharge of dredged or fill material is prohibited unless there is no practicable alternative and every attempt is made to mitigate adverse impacts. The intent of the filling of wetlands under this action is to preserve and protect a larger wetlands area from contamination.

Action Specific ARARs

40 CFR Part 264, Subpart J (RCRA Tank requirements): Substantive permit requirements are applicable to on-site storage tanks.

40 CFR Part 761, Subpart D (TSCA PCB storage and disposal regulations): Substantive TSCA storage restrictions including marking tanks with PCB warning labels are applicable to on-site storage of PCB contaminated oil. These regulations also include a one year limit on storage of PCB contaminated materials, which will be exceeded for this remedial action. This is not considered a substantive permit requirement.

40 CFR Part 761, Subpart G (TSCA PCB Spill cleanup policy): Not applicable to spills occurring prior to May 4, 1987, the effective date of the policy. Applicable to spills occurring during the removal, transport, handling, or storage of PCB contaminated oil

during implementation of this remedial action. Cleanup levels specified in Subpart G are relevant and appropriate but may not be met due to the limited scope of this operable unit.

40 CFR Part 144 (Underground Injection Control): Shallow well injection of treated groundwater is allowed for CERCLA cleanups.

20 CFR Part 1910 (OSHA Hazardous Waste Regulations): Personnel protection measures for workers at hazardous waste sites are applicable.

325 IAC 6-5 (Indiana Fugitive Dust Control Plan): Requires every available precaution be taken during construction to minimize fugitive dust emissions. Substantive requirements apply to on-site actions.

Cost Effectiveness

Alternative 4A has been selected because it is 1) protective of human health and the environment, 2) consistent with alternatives being considered for the final site remedy and 3) cost-effective. The less expensive extraction system without a slurry wall was not selected because the risk of migration of contaminants outside the recapture area and the less efficient oil extraction system were judged to outweigh the lower cost. Oil storage was chosen over oil incineration at this time because combining oil treatment with waste and soil treatment being considered for the final remedy was judged to have the potential to save money while not sacrificing protection to human health and the environment.

Utilization of Permanent Solutions and Alternate Treatment Technologies to the Maximum Extent Practicable, and Preference for Treatment as a Principal Element

The intent of this operable unit is to provide effective remediation of the immediate threat posed by oil seepage into wetlands areas while providing flexibility in developing a final remedy for the site. Utilization of permanent solutions and alternative treatment technologies was not considered practicable within the limited scope of this operable unit. Oil storage will allow for easy implementation of a permanent treatment technology in the final remedy.

APPENDIX A
NINTH AVENUE DUMP
GARY, INDIANA
SUMMARY

I. RESPONSIVENESS SUMMARY OVERVIEW

In accordance with CERCLA Section 117, a public comment period was held from July 5, 1988 to August 4, 1988, to allow interested parties to comment on the United States Environmental Protection Agency's (EPA's) Phased Feasibility Study (PFS) and Proposed Plan for an interim remedy at the Ninth Avenue Dump site. At a July 13, 1988 public meeting, EPA presented the Proposed Plan for the Ninth Avenue Dump site, answered questions and accepted comments from the public.

The purpose of this responsiveness summary is to document comments received during the public comment period and EPA's responses to these comments. All comments summarized in this document were considered in EPA'S final decision for an interim remedial action at the Ninth Avenue Dump site.

II. BACKGROUND ON COMMUNITY INVOLVEMENT

Ninth Avenue Dump (and another National Priorities List site, Midco I) is located in Gary near its border with Hammond. A Hammond residential area called Hessville is the closest residential area to the site, approximately 1/8 mile west of the site. Gary and Hammond public officials and Hessville residents have been actively involved with both of these sites.

Community concern intensified in June 1981, when heavy rainfall resulted in flooding from the area around Ninth Avenue Dump and Midco I to the Hessville neighborhood. Several residents complained of chemical odors in flooded basements and chemical burns from contact with flood waters. EPA's Technical Assistance Team sampled flood waters a few days after the flood and analyzed for volatile organics. None were detected.

Hessville residents constructed a dirt dike across Ninth Avenue at the Cline Avenue overpass. The dike is located at the corporate boundary between Gary and Hammond and obstructs traffic between the two communities. The dike remains a source of controversy between Gary and Hammond public officials and residents.

EPA has held several public meetings since the initiation of a preliminary investigation by the site operator in 1983. Approximately 50 residents and public officials attended the July 13, 1988 public meeting. Residents were concerned about health risks to Hessville residents due to past and future flooding events. They also expressed a desire to see complete remediation of the site as quickly as possible, and requested that EPA pay for measures to prevent future flooding in the Hessville neighborhood.

Several oral comments were accepted at the public meeting. EPA received only one written submittal, prepared by potentially responsible parties (PRPs), during the public comment period. Questions and comments are summarized and addressed in the next section.

III. SUMMARY OF SIGNIFICANT COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

The comments are organized into the following categories:

A. Summary of Public Hearing Comments
   1. Comments on the Remedial Investigation and Endangerment Assessment
   2. Comments on the Feasibility Study and Proposed Plan
   3. Comments on Enforcement Issues
   4. Other Comments

B. Summary of Comments by Potentially Responsible Parties

The comments are paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript and written comments available at the public repository for further information.

A. SUMMARY OF PUBLIC HEARING COMMENTS

1. COMMENTS ON THE REMEDIAL INVESTIGATION AND ASSESSMENT

COMMENT:

What risks are there to children exposed to contaminants from the site when chemicals were originally disposed of at the site, at those times when flooding occurred?

RESPONSE:

It is impossible to assess risks due to exposure to past site conditions, for which we have no analytical data. Surface cleanups have been implemented on both the Ninth Avenue and Midco I sites since flooding occurred in 1981, so risks due to present site conditions are much less than in the past. In the Endangerment Assessment, lifetime exposure scenarios were considered for contact with contaminated surface water given current site conditions. This scenario did not indicate the presence of a significant risk to individuals assumed to come in direct contact with contaminated surface water once every two weeks, eight months out of the year for 70 years. The actual exposures to children are anticipated to be intermittent and for a shorter duration and lower frequency than the assumed exposure scenario used in the Endangerment Assessment, thus, actual risks should be very low.

COMMENT:

Would residents be safe if flooding occurred in the Hessville area given current site conditions? If the clay containment barrier proposed by EPA were installed, would residents be safe from health risks due to flooding? Would it be safe enough to plant a garden and eat homegrown vegetables?

RESPONSE:

The large number of tanks and barrels that were sitting on the surface of the Ninth Avenue Dump site in the early 1980s have been removed from the property. By removing these tanks and barrels, the largest risk for release of contamination from surface water runoff during times of heavy rainfall has been reduced. Although surface soil contamination does exist at the site and may act as a minor contaminant source to surface water, it is anticipated that the chemical and physical properties of the contaminants would inhibit extensive contamination of surface water runoff.

The Endangerment Assessment and results of soil sampling in the Hessville neighborhood indicate that residents nearest the site who have backyard gardens are at little to no risk from eating homegrown garden produce.

COMMENT:

Persons living in a three block area located south of the site, in the neighborhood of 21st Street, have had every other home lose one or two people to cancer because well water was used up until the 1970's.

RESPONSE:

Groundwater flow in the area is north toward Lake Michigan, which is the opposite direction of the residential neighborhood referenced in the comment. There is no evidence to indicate that groundwater originating near the Ninth Avenue Dump site could have caused health risks to residents of this neighborhood.

2. **COMMENTS ON THE FEASIBILITY STUDY AND PROPOSED PLAN**

COMMENT:

Why was on-site storage of the oil selected as opposed to storage at an existing nearby storage facility?

RESPONSE:

On-site oil storage was used in the cost estimates versus off-site storage primarily because current regulations prohibit storage of a RCRA hazardous waste in a facility not in compliance with RCRA and TSCA requirements for storage of such a waste. It is unlikely that existing storage facilities in the area are compliant with these regulations, nor is it likely that a waiver to these regulations could be obtained. Also, if on-site treatment is selected as a final remedy, off-site storage will require costly and unnecessary transportation to and from the site. If a RCRA and TSCA compliant off-site facility is identified in the design phase, the merits of this proposal will be considered.

COMMENT:

What percentage of the oil would likely be recovered with the proposed extraction system?

RESPONSE:

Approximately 40 to 70 percent of the total oil volume is estimated to be recoverable. This corresponds to an estimated recoverable volume of oil between 100,000 to 500,000 gallons.

COMMENT:

Oil should be treated immediately instead of stored.

RESPONSE:

EPA selected oil storage rather than treatment as the preferred remedy because contacts with off-site commercial incinerators indicated they would not be willing to accept dioxin contaminated oil. Since on-site treatment will be considered for contaminated soils and waste, it is more cost-effective to implement a treatment system which can treat all contaminated media, rather than treating oil separately from waste and soils.

COMMENT:

Why does the selected alternative only consider oil removal and not removal of the other contaminant source materials such as waste and soil, thereby allowing further release of contaminants to groundwater by leaching?

RESPONSE:

The purpose of the Phased FS was to evaluate alternatives for the first phase of remedial response at the Ninth Avenue site. It was

intended to address the immediate threat of migration and continued release of contaminants to groundwater posed by the most mobile of the contaminant sources, i.e., the oil layer. The selected alternative is intended to reduce the immediate threat and is not intended to be the final site remedy. To include other contaminated media in the interim remedy would delay the start of cleanup of the immediate threats at the site.

COMMENT:

Why will the recovered groundwater be discharged back into the groundwater as opposed to surface water?

RESPONSE:

Recharge of recovered groundwater inside the containment barrier is necessary to increase flow gradients toward the recovery wells, thereby increasing the rate and efficiency of oil recovery.

A small quantity of water will be discharged into the aquifer outside of the containment barrier to compensate for infiltration. This water will be discharged to the aquifer rather than surface water because salt will not be removed from the water. This may be harmful to aquatic life.

COMMENT:

What standards will be met for groundwater treated and discharged into the aquifer?

RESPONSE:

Water discharged outside the containment barrier will be treated to Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act, or 10^{-6} carcinogenic risk. Salt will not be treated. Water discharged inside the slurry wall will not be treated.

COMMENT:

Will construction of the proposed containment barrier in a wetlands area comply with Clean Water Act (CWA) dredge and fill regulations?

RESPONSE:

Regulations under Section 404 of the CWA require a permit for filling in a wetlands area. CERCLA exempts on-site remedial actions from all but substantive permit requirements. EPA is coordinating with permit reviewers to ensure that the proposed filling will comply with substantive requirements. Section X of this Record of Decision further discusses these requirements.

COMMENT:

The cost to construct dikes along Ninth Avenue to keep flood water from entering the Hessville neighborhood should be funded by Superfund.

RESPONSE:

CERCLA Section 111(b)(1), states that "claims resulting from a release or threat of release of a hazardous substance from a vessel or facility may be asserted against Superfund." The Endangerment Assessment indicates risks are very low from exposure to surface water present at the site. In addition, there is reason to believe that surface water from the site, when diluted during a heavy rainfall event, would not pose a significant threat to the neighboring community. Therefore, funding of the proposed dikes along Ninth Avenue could not be justified under Superfund.

3. COMMENTS ON ENFORCEMENT ISSUES

COMMENT:

How many companies' wastes were disposed of at the site?

RESPONSE:

EPA currently has a list of approximately 170 potentially responsible parties (PRPs) for the site.

COMMENT:

Have PRPs been notified of their potential liability with respect to the site?

RESPONSE:

Special Notice Letters were sent to all identified PRPs in July 1988. These letters informed PRPs of the upcoming interim cleanup at the site and allowed them an opportunity to participate in the cleanup.

COMMENT:

What information about PRPs is available to the public?

RESPONSE:

A copy of the Special Notice Letter sent to PRPs and a list of companies receiving the letters is available in the Administrative

Record file at Gary City Hall and EPA Region V offices. PRP comments on the proposed interim remedy and notes from a meeting between EPA and PRPs discussing the preferred remedy are also available in the Administrative Record file.

COMMENT:

It is unlikely that negotiations with PRPs will be completed in four months.

RESPONSE:

Section 122 of SARA requires a 120 day moratorium before commencement of remedial action for negotiations with PRPs. It is EPA's policy that negotiations are extended beyond the 120 day period only in extreme or unusual circumstances. At this time, EPA has no plans to extend the negotiation period.

4. **OTHER COMMENTS**

COMMENT:

EPA did not allow 30 days after the public meeting for submission of public comments.

RESPONSE:

A 30 day public comment period started July 5, 1988, when EPA informed the public that the Administrative Record was available in the public repository. The public meeting was held 8 days after the start of the public comment period to allow interested citizens to become familiar with documents in the repository before attending the meeting.

COMMENT:

Is it true that EPA rarely changes a proposed plan in response to public comments?

RESPONSE:

EPA selects the preferred remedy after preparation of a detailed technical study and consideration of several selection criteria, including community acceptance. In only a few cases has there been significant public response asking EPA to change a proposed remedy. In these cases, EPA has considered and sometimes changed the remedy selected for a site.

COMMENT:

EPA should explain to residents that Technical Assistance Grants (TAGs) are available to help the public understand the RI/FS and proposed plan.

RESPONSE:

The 1986 Amendments to CERCLA established the TAG program to allow persons living near and affected by a Superfund site to provide informed public comment on Superfund cleanups. Grants of up to $50,000 can be provided to eligible groups to review EPA records and provide technical information to the community. Those interested in obtaining a TAG grant or in getting further information should contact EPA Region V offices.

COMMENT:

Will the citizens of Gary and Hammond have to pay for the cleanup?

RESPONSE:

The cleanup at the Ninth Avenue Dump site will be financed by responsible parties, or by revenues collected through the Superfund tax. This tax is for the most part directed towards the oil and other chemical industries. The cleanup will not affect taxes of Gary and Hammond residents.

COMMENT:

Why has it taken three years to complete the RI and Phased FS?

RESPONSE:

The soil and groundwater contamination at this site is complex because of the many different types of hazardous waste dumped at the site and the complex groundwater flow patterns. This is further complicated by the numerous potential sources of contamination outside of the site.

To completely characterize the site, over 300 soil, groundwater, surface water, sediment and oil samples were taken and analyzed for more than 150 compounds. A long period of time was needed to take these samples using adequate safety precautions, analyze them, interpret the data and write an RI report and develop an FS to determine appropriate methods of cleanup for the site.

COMMENT:

How long will it take before remedial action is initiated at the site?

RESPONSE:

EPA anticipates that 12 to 18 months will be required to conclude negotiations with potentially responsible parties, complete remedial design, and initiate remedial action at the site.

COMMENT:

Is EPA willing to buy homes in Hessville?

RESPONSE:

The results of soil analyses and the Endangerment Assessment show that there is little to no health risk to residents in the Hessville area from the Ninth Avenue site. Therefore, EPA has no justification for buying homes in the Hessville area.

COMMENT:

There is continued uncontrolled dumping in several areas around the site.

RESPONSE:

EPA encourages citizens to inform us or the Indiana Department of Environmental Management (IDEM) of specific incidents of uncontrolled dumping in the area.

COMMENT:

The groundwater under Ninth Avenue Dump is part of an active aquifer which is being contaminated from several sources and is discharging to Lake Michigan.

RESPONSE:

The groundwater under Ninth Avenue Dump is part of the Calumet Aquifer. In the vicinity of the site, this aquifer flows north and discharges to the Grand Calumet River and Lake Michigan. It is true that this aquifer has been contaminated from several sources. EPA and IDEM are attempting to address as many sources of contamination as possible under the Superfund program, as well as other State and Federal environmental laws.

B. SUMMARY OF COMMENTS BY POTENTIALLY RESPONSIBLE PARTIES

COMMENT:

On-site storage of the recovered oil would pose unnecessary risks to the local community. The Agency has also understated the time, effort and costs associated with on-site oil storage.

RESPONSE:

During recovery operations, standard security measures will be taken to prevent trespassers from damaging or compromising the integrity of the storage tank. In addition, there would likely be sufficient activity at the site associated with implementation of the interim and final remedies during this time to deter vandalism. Two 5,000 gallon on-site storage tanks have not been damaged since their installation two years ago. For these reasons, it is anticipated that the presence of an on-site storage tank for the recovered oil would not pose unnecessary risks to the local community. The estimated costs for on-site oil storage considered these factors and were based, in part, upon RCRA and TSCA requirements, and vendor interviews.

COMMENT:

It is not necessary to initiate collection of the oil now when it could just as effectively be initiated at the time the final remedy is implemented by using a faster method of oil collection such as a series of well points.

RESPONSE:

Oil recovery will likely be part of the full site remedy, because the oil layer is the primary source of contamination at the site and its presence would likely hinder the implementation of other remediation activities. Alternative methods of oil collection intended to increase the rate of oil recovery (i.e., well points) could possibly emulsify the oil, thereby increasing the volume of liquid to be treated, and would also have the effect of dewatering the area within the containment barrier. In addition, because of the viscous nature of the oil layer and the heterogeneous nature of the porous media, collection rates are, at present, unknown. Design phase studies will give a better indication of actual oil collection rates. It would therefore be advantageous to initiate oil collection as soon as possible to accelerate the overall remediation process.

COMMENT:

If the oil is collected now, it should be directly sent to an off-site incinerator or to an off-site storage facility.

RESPONSE:

Based on contacts with several commercial incineration facilities to date, no facility is willing to make a firm commitment to accept the PCB and dioxin contaminated oil. Temporary oil storage would be required prior to on-site incineration, because it would be necessary to accumulate a volume large enough to justify mobilization of an incinerator. In addition, the actual sizing and system configuration

will depend on design phase information and on getting a more concrete handle on off-site facility availability. Furthermore, the oil could not be temporarily stored off-site at a nearby storage facility unless facility compliance with RCRA and TSCA regulations pertaining to storage of a hazardous and toxic waste could be found.

If additional information is gathered during the design phase indicating that an off-site commercial incinerator would be willing to accept this oil, off-site incineration will be reconsidered.

COMMENT:

The excess water management requirements and associated costs of the selected alternative are understated and a higher capacity (i.e., greater than 1 gpm), more complex treatment system would be required.

RESPONSE:

The required capacity of the groundwater treatment system was estimated assuming a conservative estimate for average annual infiltration. Available soil storage capacity would be utilized, and the system would be operated over a relatively short period of time until the full-site remedy could be implemented. The proposed treatment system would be intermittently operated with an actual capacity larger than 1 gpm. The average, long-term flow is anticipated to be approximately 1 gpm. The differences in estimates of excess water would only affect the operation and maintenance costs and would not likely affect the system capital cost. In addition, the unit costs of treatment stated in the Phased FS are consistent with estimates from recent studies and are based in part upon vendor interviews.