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Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R07-89/024
September 1989

EPA

Superfund Record of Decision:

Chemplex, IA

50272-101

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SUPERFUND RECORD OF DECISION
Chemplex, IA
First Remedial Action

5. Report Date
09/27/89

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14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)
The Chemplex site is in Clinton County within 5 miles of Clinton, Iowa, and includes a landfill, a waste water treatment plant, and an adjacent facility which manufacturers high and low density polyethylene. Several residences with private wells are located around the site and a tributary to Rock Creek lies to the west and southwest of the site. Rock Creek eventually discharges to the Mississippi River just above the Upper Mississippi River Wildlife Refuge. The direction of ground water flow beneath the site appears to be toward the southwest, although a mounding effect is causing ground water to flow radially from the center of the landfill. From 1968 to 1978 the landfill area was used for disposal of various plant wastes including black oily sludge, scrap polyethylene, construction debris, and carbonate sludge. The debutanized aromatic concentrate (DAC) area, which consists of a pit and DAC product storage and loading areas, was contaminated by DAC spillage. In 1987, waste was reportedly removed from the pit and disposed of in a RCRA permitted landfill. Wastes and spills have contaminated the soil and ground water underneath the landfill and DAC areas. This first operable unit will address the plumes of ground water contamination. A subsequent operable unit remedy for this site will address the cleanup of soil and other ground water remediation that may be required. The primary contaminants of concern affecting the ground water are VOCs including benzene, toluene, xylenes, TCE, and PCE; and other organics including carcinogenic and noncarcinogenic PAHs. (See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision -Chemplex, IA
First Remedial Action
Contaminated Media: gw
Key Contaminants: VOCs (benzene, toluene, xylenes, TCE, PCE), other organics (PAHs)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 65
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(See ANSI-Z39.18) *See Instructions on Reverse*

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EPA/ROD/R07-89/024
Chemplex, IA
First Remedial Action

6. Abstract (continued)

The selected remedial action for this first operable unit includes pumping and pretreatment of ground water followed by treatment of pretreated ground water at the existing onsite biological activated sludge wastewater treatment plant with discharge to the Mississippi River via Rock Creek; and implementation of ground water use restrictions. The estimated present worth cost for this remedial action is $2,622,000, which includes an annual O&M cost of $219,600 for 30 years.

CHEMPLEX SITE

RECORD OF DECISION

THE LANDFILL AND DAC AREAS

GROUND WATER OPERABLE UNIT

September 1989

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GROUND WATER OPERABLE UNIT

September 1989

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Chemplex Site
Clinton, Iowa

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected operable unit remedial action for the Chemplex site, in Clinton, Iowa, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (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 document explains the factual and legal basis for selecting the remedy for this site.

The Iowa Department of Natural Resources concurs with the selected remedy. The information supporting this remedial action decision is contained in the administrative record for this site.

ASSESSMENT OF THE SITE

Releases of volatile organic compounds and polynuclear aromatic hydrocarbons have occurred in the soil and ground water at this site.

DESCRIPTION OF THE SELECTED REMEDY

This operable unit is the first of at least two operable units for the site. This ground water operable unit remedy will initiate control over the plumes of ground water contamination in the landfill and Debutanized Aromatic Concentrate (DAC) areas. A subsequent operable unit remedy for this site will address cleanup of the soils in these two areas and other ground water remediation that may be required. Additional Remedial Investigation/Feasibility Studies (RI/FSs) may be conducted in the future on other areas of the Chemplex site.

The major components of the selected remedy include the following:

- Institutional controls to restrict use of ground water.

- Extraction of ground water by placement of extraction wells in the plumes of the two areas.

- Pretreatment of the extracted ground water.

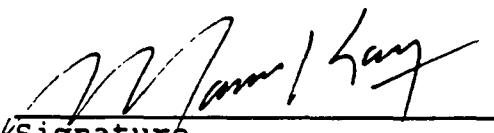
- Treatment of the extracted ground water at the existing onsite wastewater treatment plant.

- Discharge of the treated ground water to the Mississippi River via a federally permitted discharge (NPDES permit).

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment technologies that reduce toxicity, mobility, or volume as their principal element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.



Signature
EPA Regional Administrator

9-27-89
Date

1.0 INTRODUCTION

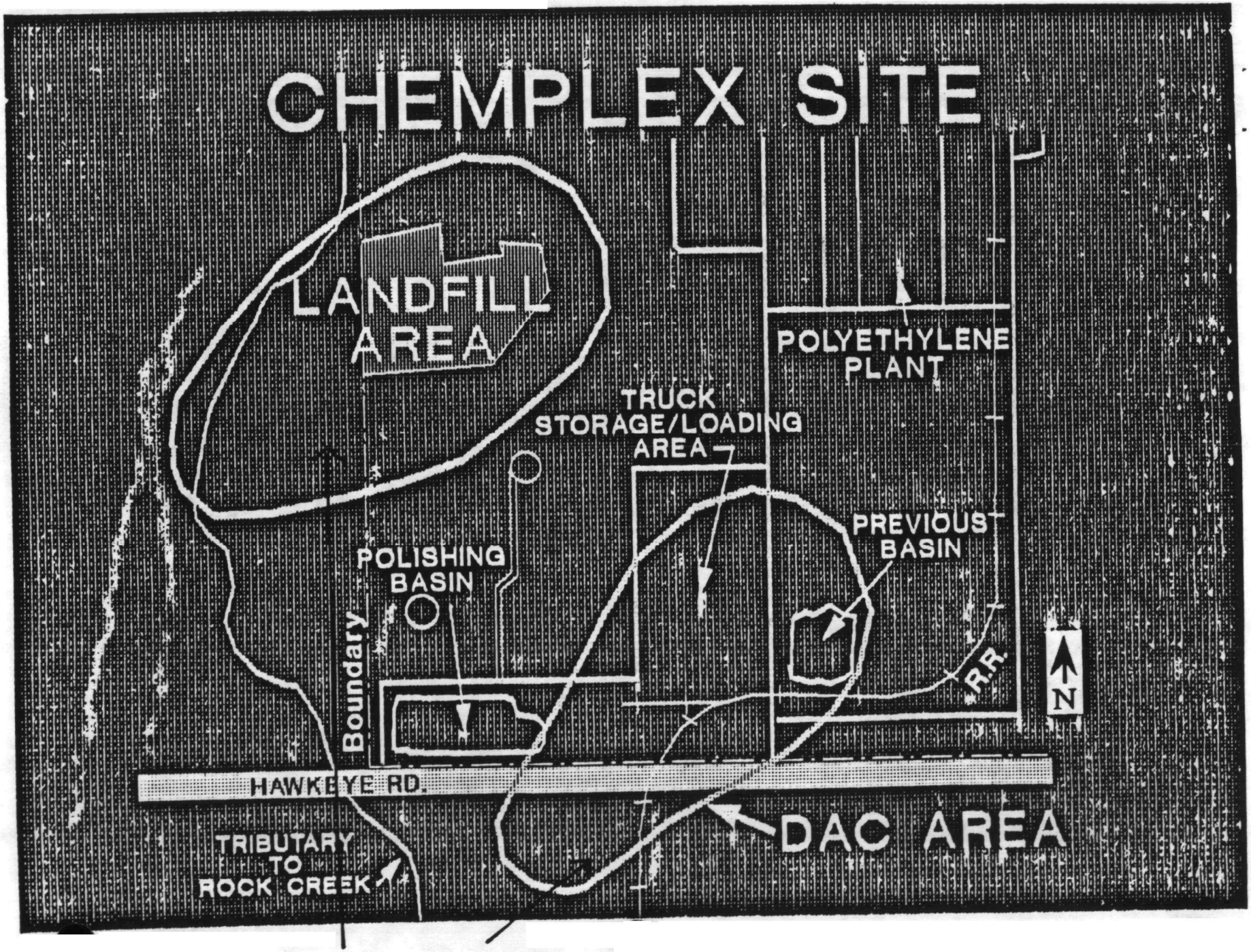
1.1 SITE DESCRIPTION

The Chemplex site (also known as Quantum Chemical Corporation, herein Quantum) is located within 5 miles of Clinton, Iowa in Clinton County. The site includes a landfill and the adjacent facility, which manufactures high and low density polyethylene (herein the Quantum facility). The Quantum facility has been in operation since approximately 1967. As shown on Figure 1-1, the landfill and debutanized aromatic concentrate (DAC) area within the Quantum facility are the focus of this Record of Decision.

From 1968 to 1978, the landfill area was used for disposal of various plant wastes generated at the Quantum facility plant including black oily sludge, scrap polyethylene, construction debris, and carbonate sludge. The principal contaminants of concern in the landfill include benzene, toluene, ethylbenzene, and xylenes (BTEX), polynuclear aromatic hydrocarbons (PAHs), and the chlorinated hydrocarbons; trichloroethylene (TCE), tetrachloroethylene (PCE), and 1,2-dichloroethylene. The plant wastes have contaminated the soil and ground water underneath the landfill.

The DAC area consists of the "previous basin" and DAC product storage and loading areas. The previous basin, a pit, was used as a temporary storage area during reconstruction of the polishing basin (the last unit of the current onsite wastewater

Figure 1-1


CHEMPLEX SITE
LANDFILL AREA
POLYETHYLENE PLANT
TRUCK STORAGE/LOADING AREA
PREVIOUS BASIN
POLISHING BASIN
Boundary
R.R.
N
HAWKEYE RD.
DAC AREA
TRIBUTARY TO ROCK CREEK
Designates Area Boundaries

treatment plant) from 1977 through 1987. According to the potentially responsible parties (PRPs) for this site, in 1987 the waste was removed from the previous basin and disposed of in a RCRA permitted landfill. The principal contaminants of concern in the DAC area are BTEX and PAH compounds. Although extensive sampling to detect the chlorinated hydrocarbons was not conducted in either the landfill or DAC areas, EPA believes that these compounds are more prevalent in the landfill area than the DAC area. This is because chlorinated hydrocarbons may have been disposed in the landfill and the DAC product does not contain the chlorinated hydrocarbons. However, chlorinated hydrocarbons were detected in the DAC area. Contaminated media in the DAC area include the soils and upper and lower ground water aquifers.

The lead agency for this site is EPA. The support agency is the Iowa Department of Natural Resources (IDNR).

1.2 ENFORCEMENT HISTORY

On September 18, 1987, EPA entered into an Administrative Order on Consent, EPA Docket No. 87-F-0012, (herein Consent Order) with the potentially responsible parties (PRPs), USI, now Quantum Chemical Company (herein Quantum), ACC Chemical Company (herein ACC) and Getty Chemical Company (herein Getty), to investigate the landfill and DAC areas. The Consent Order was issued pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980

(CERCLA), 42 U.S.C. §9606(a) and Section 3013 of the Resource Conservation and Recovery Act, as amended (RCRA), 42 U.S.C. § 6934. In March 1988, the PRPs contacted the Agency and requested a modification of the Consent Order and an extension of time to complete the requirements of the Consent Order. On August 16, 1988, the Consent Order was amended and Getty and ACC were required to submit the final remedial investigation/ feasibility study (RI/FS) reports for the DAC and landfill areas no later than December 1988. EPA received the draft RI/FS report in December 1988. EPA reviewed the draft report and sent numerous comments and recommended revisions in April and May 1989. The EPA found that the RI/FS report did not fully characterize the nature and extent of contamination in the DAC and landfill areas, nor did the feasibility study consider all of the viable remedial alternatives for the treatment of ground water from these areas. In June of 1989, the PRPs submitted the final RI/FS report. Because information gaps remained in the final report, EPA contracted with Jacobs Engineering to prepare a Focused Feasibility Study Report. The Focused Feasibility Study Report, the RI/FS submitted by ACC and Getty, and EPA's comments and recommended revisions thereto, all form a basis for this Record of Decision.

The Quantum facility, including the DAC area, but excluding the landfill area, is regulated by RCRA. The landfill was closed in 1978 prior to the effective date of the RCRA regulations

governing the operation of such facilities. At that time, ACC and Getty operated the landfill and it was part of the polyethylene manufacturing facility, which was known as the Chemplex Company. In 1984, when Quantum began operating the facility, the landfill was subdivided from the facility. The City of Clinton, Iowa owns the real property where the Quantum facility is located as well as the landfill. The City leases the facility to Quantum and the landfill to Getty and ACC.

The Quantum facility currently operates as an interim status RCRA facility with authority for the storage of hazardous wastes. The operators of Quantum are seeking a RCRA operating permit and have submitted their Part B RCRA permit application. In May 1989, EPA began a RCRA Facility Assessment (RFA) of the Quantum facility. The landfill area is not included in the RFA nor the RCRA Part B permit application. The DAC area is included in the permit application and, except for the truck loading and unloading area, it is included in the RFA. Additional activities using RCRA authority may be necessary at the site, including a RCRA Facility Investigation, corrective action, and possibly a RCRA operating permit.

The Quantum facility is also regulated by the IDNR in accordance with State laws and the Clean Water Act. Quantum has a National Pollution Discharge Elimination System (NPDES) Permit for the onsite wastewater treatment plant discharge. Quantum

also has spill prevention and control plans for onsite storage tanks containing hazardous materials.

Quantum, Getty and ACC are all potentially responsible parties under CERCLA. Although these companies have all voluntarily cooperated with EPA, the EPA has not sent special notice letters to the PRPs for negotiations pursuant to Section 122 of CERCLA, 42 U.S.C. §9622.

1.3 SCOPE AND ROLE OF OPERABLE UNIT

The selected remedial action ground water operable unit initiates the remediation of the ground water in the landfill and DAC areas of the site. Ground water remediation is necessary because it is contaminated with the BTEX, PAH, and chlorinated hydrocarbons at levels which exceed public health and environmental standards and criteria. This operable unit comprises the extraction and treatment of the ground water contamination plumes as well as some ground water source control. Ground water source control consists of the extraction of free oil from some of the wells and placement of some of the extraction wells in the landfill overburden to extract the contaminated ground water before it migrates throughout the plume.

Although the RI/FS report submitted by the PRPs presents data and remedial alternatives for soils, wastes and ground water, EPA has determined that the data and alternatives are

insufficient for selection of a remedy for the soils and wastes or for the final ground water remedy. The RI/FS and the Focused Feasibility Report present sufficient information regarding the ground water contamination in the DAC and landfill areas for the EPA to select this operable unit remedial action to begin cleanup of the contaminated ground water at the site.

The purpose of this operable unit remedial action is to mitigate the movement of the contaminated ground water from this site and to permanently treat, destroy and dispose of contaminants found in these ground water plumes. Also, this operable unit should protect the nearby downgradient private drinking water wells from these contaminated plumes prior to implementation of the final remedial action for this site. Additional remedial action operable units will be necessary to complete the cleanup of this site to protect human health and the environment from the other areas of contamination at this site, which include, but may not be limited to, the contaminated soil, wastes or debris and hazardous substances found at or near the fill, the DAC area or other areas at this site. This operable unit remedial action will be consistent with future operable units and the final remedy.

1.4 COMMUNITY RELATIONS HISTORY

As required by Section 113(k)(2)(B) of CERCLA, 42 U.S.C. Section 9613(k)(2)(B), the Proposed Plan, RI/FS Report, Focused

Feasibility Study, and the administrative record were released to the public in July 1989. The documents were made available to the public in the information repositories at the Camanche and Clinton, Iowa Public Libraries and the EPA Region VII Library in Kansas City, Kansas. The notice of availability for these documents was published in the Clinton Herald on July 24, 1989. A public comment period was held from July 24, 1989, through August 23, 1989. Community relations activities, including interviews and preparation of a Community Relations Plan, were completed on August 11, 1989. A public meeting was held on August 14, 1989, to discuss the Proposed Plan, Focused Feasibility Study, and the RI/FS documents. EPA's response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision.

1.5 SITE CHARACTERISTICS

Information regarding the site characteristics is available in the RI/FS report prepared by the PRPs and in the Hydrogeologic Assessment Report, prepared by Jacobs Engineering for the EPA as well as other documents in the administrative record. These documents form the basis for the following summary discussion.

A. Geology/Hydrogeology

The Chemplex site is covered by surficial soils that consist of a heterogeneous mixture of clays, silts, and gravel with discontinuous sand lenses. The soils are a result of former

glacial activity and are known as glacial till. The RI/FS report refers to these soils as the overburden. The overburden ranges in thickness from a few feet to an excess of 100 feet.

The overburden is underlain by bedrock that is believed to be the Anamosa formation of the Gower dolomite. The bedrock surface is typically weathered and fractured for several feet and is underlain by a more competent bedrock.

Ground water occurs in both the overburden and the bedrock. The ground water flow direction at the site appears to be toward the southwest. In the landfill overburden, a ground water mounding effect appears to be causing flow toward the north and east. The mounding effect is causing ground water to move radially from the center of the landfill. In addition, the overburden is recharging the bedrock ground water. The ground waters in the overburden and bedrock appear to be in hydraulic communication, meaning that the overburden and the bedrock ground water intermix.

B. Soils/Wastes

Various waste streams from the polyethylene plant were disposed of in the landfill from approximately 1968 to 1978, including carbonate sludge, black oily sludge, off-specification polyethylene and construction debris. A considerable amount of this waste is located at or below the ground water table in various portions of the landfill. As a result, concentrations of BTEX have been detected as high as 8644 milligrams per kilogram

(mg/kg) or parts per million (ppm), PAHs as high as 5309 ppm, and tetrachloroethylene as high as 100 ppm.

The sources of soil contamination in the DAC area appear to be spillage of DAC product in the storage and truck loading area and from the storage of wastewater treatment sludges in the previous basin and polishing basin areas. Although spill control measures, including paving, sump collection, and a berm around the DAC tank, have been implemented in the truck loading area and sludges were removed from the previous and polishing basins, contaminated soils remain and ground water contaminant plumes emanate from these areas. BTEX and PAHs were detected in the soil in the storage and truck loading area at maximum concentrations of 2198 ppm and 1267 ppm respectively. Soil contamination is suspected in the previous basin, but has not yet been confirmed because the basin was backfilled when sludges were removed in 1987.

It should be noted that additional site characterization, as well as treatability testing, will be required for the soils, wastes and debris in both the landfill and DAC areas prior to selection of a remedial action to cleanup the soils, wastes and debris. Therefore, the soils, wastes and debris will be addressed in a subsequent operable unit RI/FS and will not be discussed further in this ROD.

C. Ground Water

In the landfill area, a mounding effect in the overburden ground water appears to have resulted in plumes of contaminated ground water flowing to the north and east from the landfill area prior to recharging the underlying bedrock ground water. The highest concentrations of contaminants detected in the landfill overburden ground water plumes were 8600 micrograms per liter (ug/l) or parts per billion (ppb) BTEX, 470 ppb PAHs, and 60 ppb tetrachloroethylene (chlorinated hydrocarbon). This shallow aquifer may be periodically discharging to the small surface stream located west of the site. Tetrachloroethylene has been detected in this surface water stream at a concentration of 198 ppb, thus suggesting that this aquifer is contaminated with tetrachloroethylene.

The highest concentration of contaminants in the landfill ground water is at the overburden/bedrock interphase in an area along the southwest border of the landfill. The concentrations of contaminants in this area are 96,400 ppb BTEX and 1,821 ppb PAHs.

Ground water in the bedrock aquifer beneath the landfill has been investigated in four different zones, designated as the A, B, C and D zones representing different well screen intervals (depths) of the bedrock aquifer. See Table 1 for more details regarding well screen intervals and the monitoring wells involved in each zone. As illustrated on Figures 1-2 through 1-5, a

TABLE 1

GROUPING OF BEDROCK MONITORING WELLS
BY SCREENED INTERVAL -

Shallow Bedrock Zone A (Screened elevations 598 to 629 ft. MSL)

MW-2B
MW-5C
MW-9B
MW-10B
MW-11B
MW-12B
MW-12C
MW-19B
MW-20B
MW121B

Intermediate Bedrock Zone B (Screened elevations 567 to 598 ft. MSL)

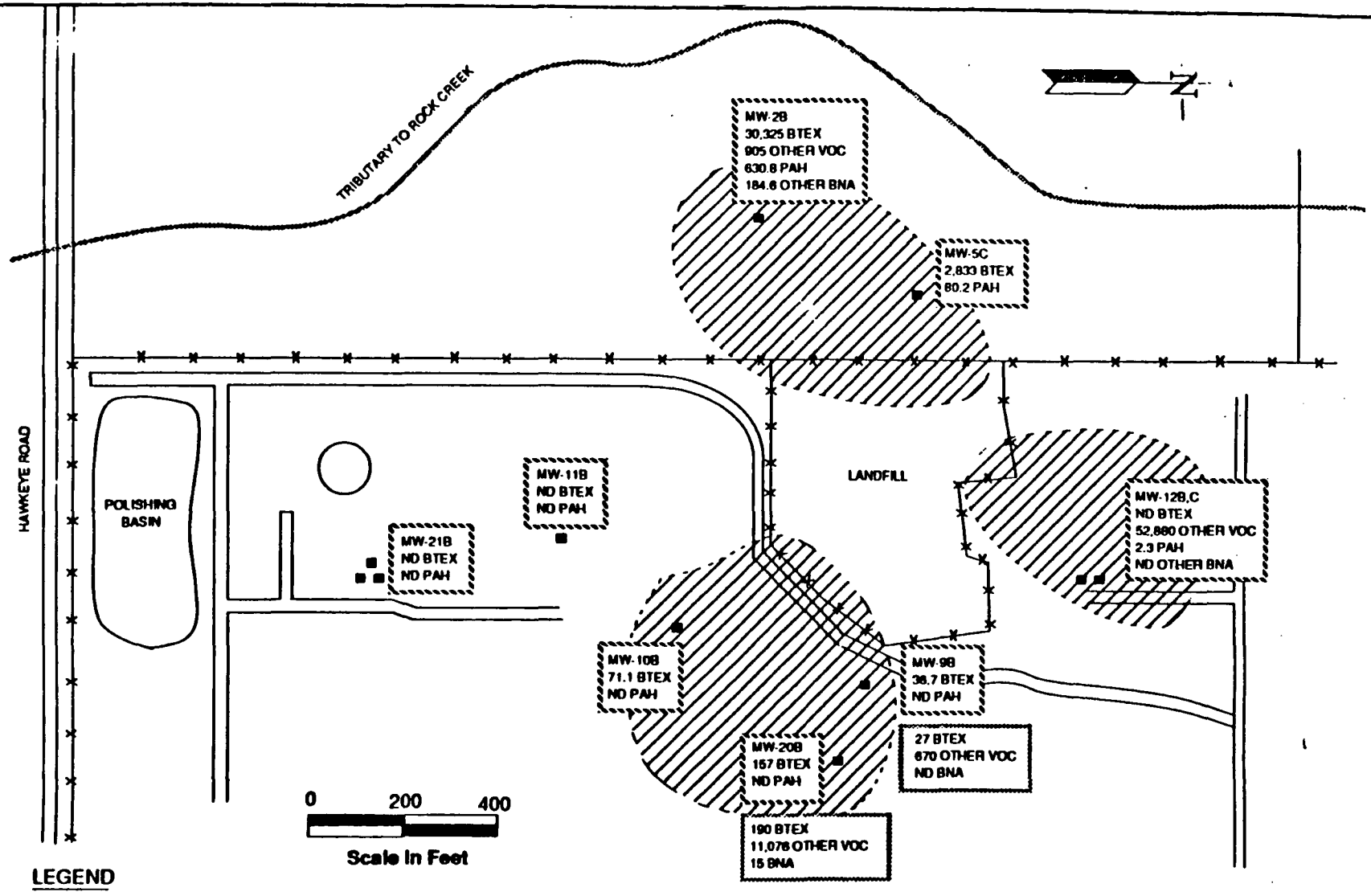
MW-2C
MW-9C
MW-10C
MW-11C
MW-13B
MW-17B
MW-18B
MW-19C
MW-21C

Deep Bedrock Zone C (Screened elevations 522 to 555 ft. MSL)

MW-13C
MW-17C
MW-18C
MW-19D
MW-20C
MW-21D

Deepest Bedrock Zone D (Screened elevations 484 to 520 ft. MSL)

MW-13D
MW-17D
MW-18D
MW-20D



LEGEND

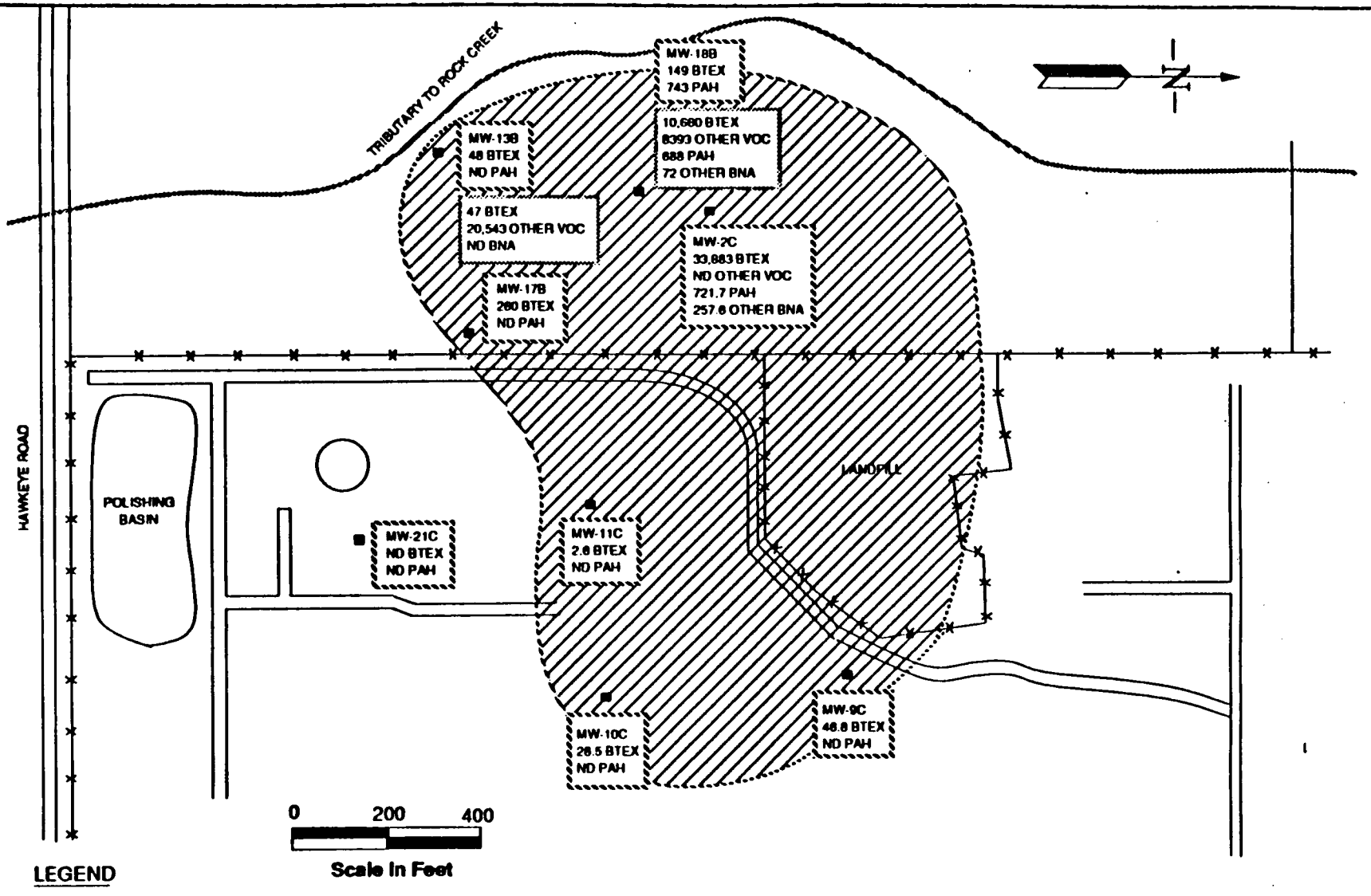
MW-2 ■ Bedrock Well

▨ RI Results

▭ EPA Results

Note: Wells MW-21B and MW-20 Sampled in Phase II. All other Wells Sampled in Phase I. Concentrations Reported in PPB.
Phase I Results Are Averages of Two Sampling Rounds BTEX= Benzene, Toluene, Ethylbenzene, Xylene.
PAH= Polynuclear Aromatic Hydrocarbons. VOC= Volatile Organic Compounds. BNA = Base Neutral/Acid Extractable Compounds.

FIGURE DESCRIPTION	SITE NAME:			FIGURE NO
TOTAL CONCENTRATIONS OF COMPOUNDS DETECTED IN SHALLOW BEDROCK WELLS ZONE A LANDFILL AREA	CHEMPLEX SITE CLINTON, IA	DRAWN BY: BJR	DATE: 8/7/89	1-2
		CHECKED BY: DK	DATE: 8/7/89	



LEGEND

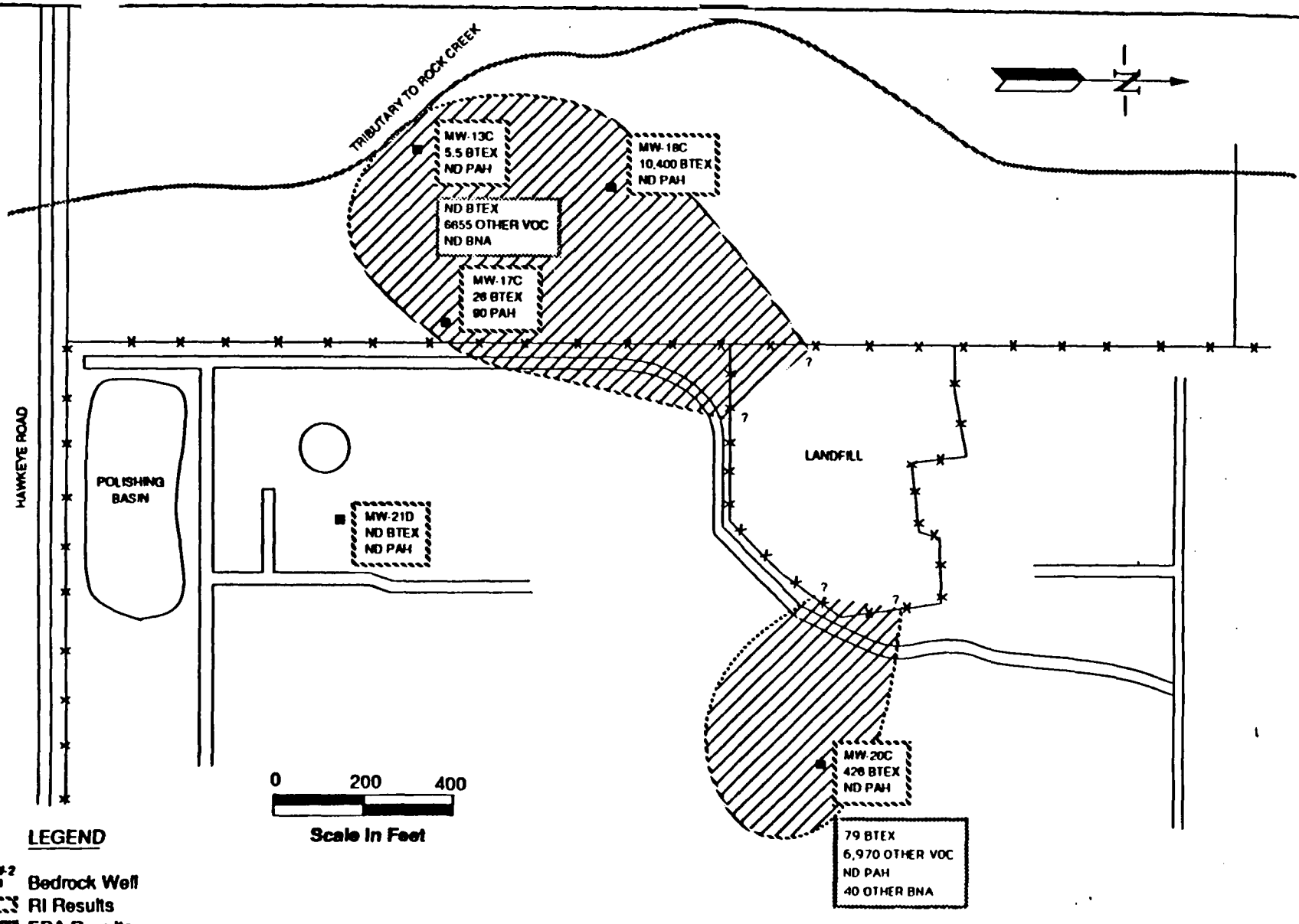
MW-2 ■ Bedrock Well

RI Results

EPA Results

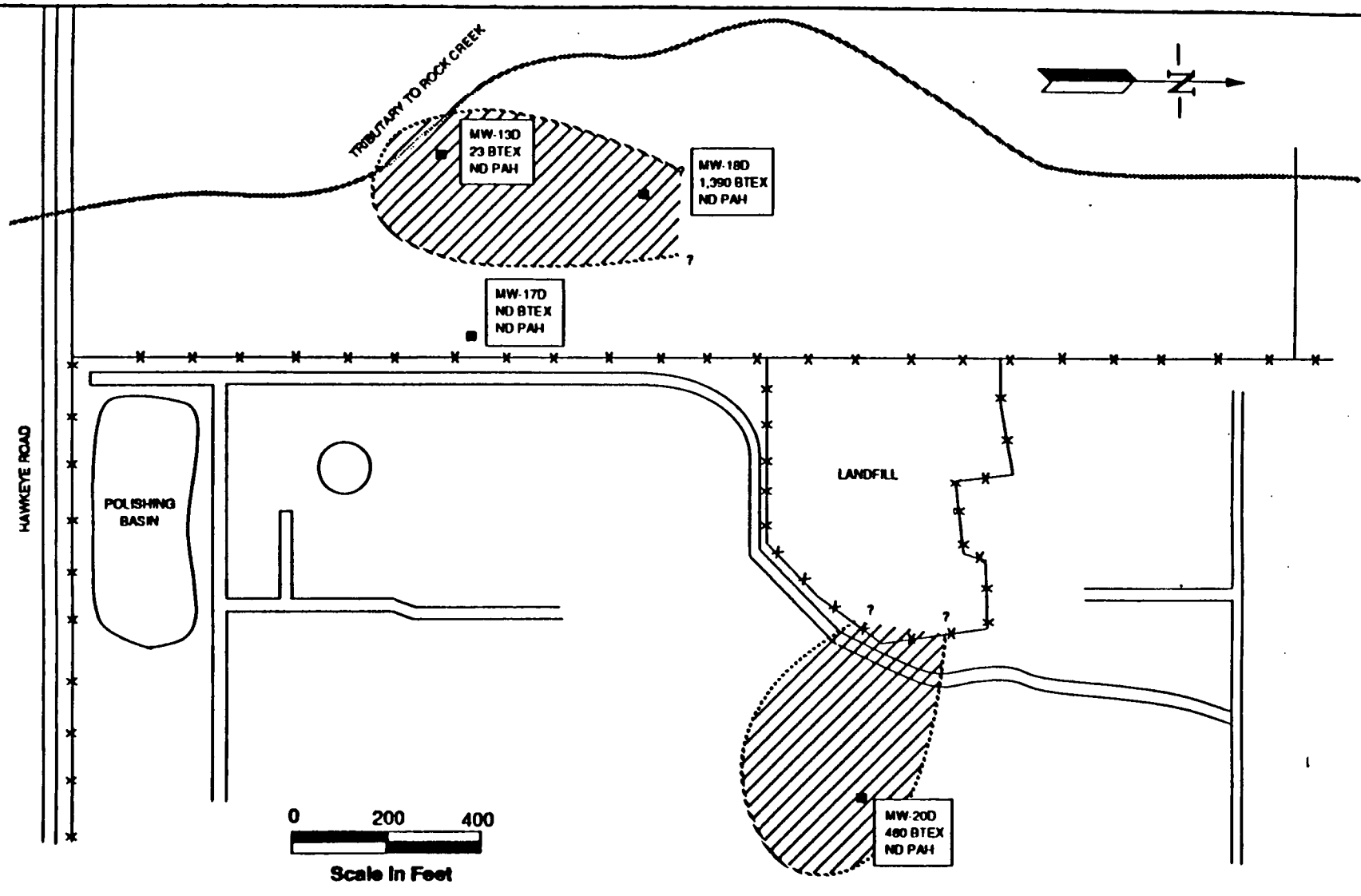
Note: Wells MW-13B, MW-17B, MW-18B And MW-21C Sampled In Phase II. All Other Wells Sampled In Phase I. Concentrations Reported In PPB. Phase I Results Are Averages of Two Sampling Rounds BTEX= Benzene, Toluene, Ethylbenzene, Xylene. PAH= Polynuclear Aromatic Hydrocarbons. VOC= Volatile Organic Compounds. BNA = Base Neutral/Acid Extractable Compounds.

FIGURE DESCRIPTION	SITE NAME:	DRAWN BY: BJR DATE: 8/7/89	FIGURE NO.
TOTAL CONCENTRATIONS OF COMPOUNDS DETECTED IN INTERMEDIATE BEDROCK WELLS . ZONE B, LANDFILL AREA	CHEMPLEX SITE CLINTON, IA	CHECKED BY: DK DATE 8/7/89	1-3



Note: All Deep Bedrock Wells Sampled In Second Round Of Phase II. Concentrations Reported In PPB.
BTEX= Benzene, Toluene, Ethylbenzene, Xylene. PAH= Polynuclear Aromatic Hydrocarbons.
VOC= Volatile Organic Compounds. BNA = Base Neutral/Acid Extractable Compounds.

FIGURE DESCRIPTION	SITE NAME			FIGURE NO
TOTAL CONCENTRATIONS OF COMPOUNDS DETECTED IN DEEP BEDROCK WELLS . ZONE C, LANDFILL AREA	CHEMPLEX SITE CLINTON, IA	DRAWN BY: BJR	DATE: 8/7/89	1-4
		CHECKED BY: DK	DATE: 8/7/89	



LEGEND

MW-2 ■ Bedrock Well

Note: All Wells Sampled In Phase II. Concentrations Reported In PPB.
BTEX= Benzene, Toluene, Ethylbenzene, Xylene.
PAH= Polynuclear Aromatic Hydrocarbons.

FIGURE DESCRIPTION	SITE NAME			FIGURE NO.
TOTAL CONCENTRATIONS OF FINGERPRINT COMPOUNDS DETECTED IN DEEPEST BEDROCK WELLS ZONE D, LANDFILL AREA	CHEMPLEX SITE CLINTON, IA	DRAWN BY BJR	DATE: 8/7/89	1-5
		CHECKED BY DK	DATE: 8/7/89	

number of contaminant plumes are emanating from the landfill area in all zones. The highest concentrations of contaminants associated with these plumes were detected in the shallow and intermediate bedrock zones. These contaminant concentrations are 52,880 ppb chlorinated hydrocarbons, and 33,883 ppb BTEX and 1,700 ppb PAHs, respectively. In the deeper bedrock zones, these contaminants are considerably lower in concentration.

The closest residential drinking water wells southwest of the facility were sampled and analyzed because these residences are located downgradient of the site and would be the first affected by movement of the plume. The analyses indicates that at this time these water wells are not contaminated from the migration of contaminants from the site. At this time, the depth at which these residential wells draw water is unknown, but this is to be determined during further RI/FS activities.

In the DAC area the ground water plume of contamination in the overburden also appears to be migrating to the southwest. The highest concentrations of contaminants detected in the DAC overburden plume are 249,000 ppb BTEX and 13,829 ppb PAHs. This plume of ground water contamination is fairly well defined as described in the RI/FS.

In the DAC area, one monitoring well was installed into the bedrock ground water. Analysis of samples taken from monitoring wells showed concentrations of 650 ug/l for benzene. The Maximum Contaminant Level (MCL) established by the Safe Drinking Water

Act for benzene is 5 ug/l and the level established by the state of Iowa is 1 ug/l for benzene. Therefore, ground water remediation is required in the bedrock as well as the overburden. However, the plume of contamination in the DAC bedrock ground water is not yet defined.

It should be noted that since the vertical and horizontal extent of contamination in the ground water is not yet completely defined for either the landfill or DAC areas, further hydrogeologic and chemical data will need to be collected during remedial design to delineate the extent of contamination. EPA believes, however, that there is sufficient information to select a remedy for the ground water operable unit at this time, since information is available regarding ground water characteristics, such as the rate and direction of ground water flow, and the RI/FS data which initially identifies the nature and general extent of certain plumes of contamination.

1.6 SUMMARY OF SITE RISKS

The PRPs prepared and submitted to EPA a "Draft Endangerment Assessment for the Chemplex Site" for the purpose of evaluating the existing and potential impacts of the site on human health and the environment. The draft Endangerment Assessment (EA) discusses contaminants of concern, adverse health effects, and exposure pathways. It should be noted that the draft EA is incomplete for three basic reasons: 1) the draft EA does not

adequately address the ground water pathway; 2) some pathways were not completely addressed based on the insufficient data that was collected during the RI/FS phase to delineate the total aereal and vertical extent of contamination; and 3) the draft EA does not adequately address volatile organic exposure via the air pathway. The EPA provided numerous comments to the PRPs regarding the deficiencies of the draft EA and these comments are available in the administrative record. As an addition to the draft EA submitted by the PRPs, EPA has included information in the administrative record and this record of decision regarding risks of exposure to the ground water. The following information summarizes the potential impacts of contamination at the site on human health and the environment. Further information on these impacts and risks is available in the draft EA, the Remedial Investigation and the administrative record.

A. Contaminant Identification

In order to allow for a realistic estimation of potential risk where a number of chemicals have been detected at the site, it is often necessary to select a list of indicator chemicals to conduct the detailed analysis of the risk assessment. Based on existing data for the contaminants found at the site and the most toxic contaminants detected on the site, the indicator compounds selected for the risk assessment included: antimony, benzene, chloroform, 1,2-dichloroethylene, ethyl benzene, carcinogenic and

noncarcinogenic polynuclear aromatic hydrocarbons (PAHs), styrene, tetrachloroethylene, trichloroethylene and toluene.

B. Human Health Exposure Assessment

The draft EA identified the following exposure pathways as being the most likely exposure scenarios and conducted site-specific analyses of carcinogenic and noncarcinogenic effects: inhalation of fugitive dust in the DAC area by onsite workers; inadvertent ingestion of, and dermal contact with, surface soil in the DAC area by onsite workers; and dermal exposure to surface water in the intermittent tributary to Rock Creek by children visiting the tributary. The draft EA erroneously did not consider the ingestion of ground water as a potential exposure pathway. Contaminant concentrations in the ground water plumes emanating from the landfill and DAC areas substantially exceed federal criteria for the protection of human health from ingestion of contaminated water. Table 1-4 compares the maximum concentration of contaminants detected in these plumes with the Maximum Contaminant Levels (MCLs) and proposed Maximum Contaminant Levels and other water quality criteria. This comparison indicates that these plumes of contamination present a substantial risk to human health from the ingestion of the contaminated ground water. Existing downgradient private drinking water wells and any future wells installed should be protected from this potential risk. The Agency for Toxic Substances and Disease Registry (ATSDR) recommends that ground

TABLE 1-4
GROUND WATER CONCENTRATIONS (ug/l) OF CONTAMINANTS
OBSERVED IN MONITORING WELLS

	Maximum in Landfill Area	Maximum in DAC Area	Criteria
Benzene	96,700	244,000	5[a]
Ethylbenzene	2,780	1,150	700[b]
Polynuclear Aromatic Hydrocarbons (PAHs)	1,821	13,800	0.20[c]
Tetrachloroethylene	50,000	190	5[b]
Toluene	10,300	27,600	2000[b]
Trichloroethylene	3,700	52	5[a]
1,2-Dichloroethylene	3,800	100	100[d]

[a] Maximum Contaminant Level (MCL) established by the Safe Drinking Water Act.

[b] Proposed Maximum Contaminant Level established by the Safe Drinking Water Act.

[c] Criteria from the 1970 World Health Organization European Standards for Drinking Water based on a composite analysis of six PAHs. Reference: Handbook of Toxic and Hazardous Chemicals and Carcinogens; Second Edition by Marshall Sittig.

[d] U.S. EPA Office of Drinking Water Health Advisory Level (HAL).

water use be restricted in the vicinity of these plumes until the ground water is remediated.

An assessment was performed to evaluate noncarcinogenic and carcinogenic potential adverse effects to human health due to exposure to the indicator compounds through various media. Although not evaluated in the draft EA, human health risks have since been calculated for the ground water pathway using concentrations at the downgradient portion of the plume and the results are presented herein. Supporting calculations can be found in a technical memorandum which is part of the administrative record. The title of this memorandum is Chemplex Facility Site, Clinton, Iowa; Endangerment Assessment of Potential Ground Water Exposure, dated September 22, 1989, by Jacobs Engineering for EPA.

The evaluation of noncarcinogenic risks included calculation of the hazard index (HI) for each media. The HI incorporates a dose response assessment for exposure to individual site-specific compounds. The daily intake (DI) or estimated dose is calculated based on ingestion or inhalation routes of exposure to the contaminated soil or ground water. The DI is then related to the established reference dose (RfD) which is defined as an estimate of a daily exposure that is likely to result in no appreciable risk of deleterious effects during a lifetime. The total HI is a summation of the DI divided by the RfD (DI/RfD) which is intended to provide a measure of possible effects of human exposure to

toxic chemicals. An HI of one (1) or greater indicates the possibility of adverse noncarcinogenic health effects.

Carcinogenic risks were assessed by estimating the excess lifetime cancer probability (the risk above background). This estimate was calculated by multiplying the estimated exposure dose by the chemical-specific cancer potency factor (CPF). The CPF is established for individual carcinogenic compounds. The CPF are then related to site-specific dose-response and exposure routes. The acceptable range for excess lifetime cancer probabilities is generally considered by EPA to be from 1×10^{-4} to 1×10^{-7} (1 in 10,000 to 1 in 10,000,000).

The draft EA calculations for noncarcinogenic risks through the dermal, inhalation and ingestion routes of workers' exposure to DAC soils is an estimated HI of 2.4×10^{-2}. Risks of children's dermal exposure to surface water is an estimated HI of 2.19×10^{-6}. The calculated HIs for these routes are less than one (1), which indicates that there would not be an unacceptable noncarcinogenic risk to human health based on available site contaminant data for the specified routes.

The HI values for the ground water pathway for ingestion of the landfill area bedrock aquifer for PCE, TCE, 1,2-dichloro-ethylene and total PAHs were calculated to be 13.6, 0.07, 1.1, and 5.1, respectively. The HI value for the DAC area overburden aquifer for total PAHs was calculated to be 41.2. These values, with the exception of the TCE value in the landfill bedrock, are

greater than one (1) and are unacceptable for noncarcinogenic health effects. Noncarcinogenic risk characterization (HI values) for benzene were not calculated because of its Class A carcinogenic classification.

The calculated lifetime cancer risks associated with workers' exposure to DAC soils was estimated to be 4.13×10^{-7} and was estimated to be 2.68×10^{-8} for children's exposure to surface water. These levels are below the 1×10^{-4} to 1×10^{-7} risk range, a level considered acceptable by EPA standards. Excess lifetime cancer risk values for the ground water pathway for the landfill area bedrock aquifer for benzene, PCE and TCE were calculated to be 4.9×10^{-2}, 1.4×10^{-2}, and 2.4×10^{-4}, respectively. Values for the DAC area overburden aquifer for benzene was calculated to be 2.9×10^{-2}. The value for the DAC area bedrock aquifer for benzene was calculated to be 3.2×10^{-4}. These values are greater than the 1×10^{-4} to 1×10^{-7} range and are considered unacceptable by EPA standards for carcinogenic health affects.

Analytical data obtained for various media during upcoming field activities may change calculated noncarcinogenic and/or carcinogenic risk because additional analytical data may yield different DI values and, thus, different HIs.

The air pathway was not adequately addressed in the draft EA. Ambient air monitoring may be conducted during future remedial investigations.

C. Ecological Exposure Assessment

The ecological risks for terrestrial and aquatic organisms were calculated by means of the toxicity quotient method. The toxicity quotient method compares an estimated environmental concentration (EEC) of an indicator chemical to an ecotoxicological benchmark (BC). The EEC is divided by the BC to obtain the toxicity quotient for the exposure of a given species to a given chemical as follows:

$$\underset{\text{(unitless)}}{\text{toxicity quotient}} = \frac{\text{EEC (ug/l)}}{\text{BC (ug/l)}}$$

Results of the toxicity quotient method are considered to be "no concern" if the ratio is less than 0.1, "possible concern" if the ratio falls within the range of 0.1 to 10, and "high concern" if the ratio is greater than 10.

The toxicity quotient was calculated for rats, mice, deer, and mallard ducks consuming food items assumed to be contaminated with the estimated soil concentration of noncarcinogenic PAH (naphthalene). It was concluded from these results that the potential for acute or chronic effects to terrestrial species from the ingestion of edible vegetation containing noncarcinogenic PAH is of "no concern". The toxicity quotient was also calculated for aquatic species exposed to chemical concentrations in the intermittent stream. It was concluded from these results that the potential for chronic effects to aquatic species from exposure to benzene, ethylbenzene, toluene and tetrachlorethylene (PCE) are of "no concern". The estimated

toxicity quotient for naphthalene is in the lower range of the "possible concern" category. However, since naphthalene was not actually detected in the stream, a concentration of ½ of the detection limit was used to calculate the toxicity quotient. This is a conservative assumption and, therefore, it is anticipated that the actual toxicity quotient would be lower than the calculated value.

It should also be noted that the concentrations of contaminants in the one surface water stream sample of the tributary to Rock Creek did not detect any contaminants that exceeded any EPA Water Quality Criteria for Protection of Aquatic Life. Based on available data, it does not appear that terrestrial and aquatic organisms are adversely impacted by the site. It should also be noted that the overburden ground water periodically discharges to this intermittent stream. The draft EA did not consider periodic exposures of the aquatic life to the ground water in this stream. The next operable unit remedial investigation may include additional sampling of this stream and a reevaluation of the risks to aquatic life.

This Upper Mississippi River Wildlife Refuge is located just a few miles from the site and bald eagles (an endangered species) have been seen at this refuge. The current data indicates that the contamination from this site does not affect this wildlife refuge. While the threat of contamination from this site reaching this refuge was not considered in the draft EA, such a

threat should be evaluated in the next operable unit. In addition, the potential impacts on, or threats to, this wildlife refuge must be considered during any response activities at this site, particularly if the second operable unit RI/FS or remedial actions might influence Rock Creek or the NPDES discharge.

2.0 ALTERNATIVES EVALUATED

Remedial alternatives were screened based on effectiveness, implementability and relative capital, operations, and maintenance costs. Containment and in situ treatment of ground water were eliminated because of implementability and effectiveness limitations as detailed in the RI/FS submitted by the PRPs.

The EPA evaluated three alternatives in detail in the Focused Feasibility Study for this operable unit. These alternatives were 1) no action, 2) extraction and treatment at the existing onsite treatment plant with pretreatment, and 3) extraction and treatment at a new onsite wastewater treatment plant. A description of these alternatives is provided below.

2.1 ALTERNATIVE 1 - NO ACTION

The no action alternative would allow site conditions to remain as they currently exist. Evaluation of the no action alternative is required by the National Contingency Plan (NCP)

and also provides a baseline for comparison with the other alternatives.

2.2 ALTERNATIVE 2 - EXTRACTION AND TREATMENT AT EXISTING WASTE WATER TREATMENT PLANT WITH PRETREATMENT

Alternative 2 provides for the extraction of the contaminated ground water in the overburden and in the deep aquifers at both the landfill and DAC areas. The contaminated ground water would be extracted at a rate of approximately 140 gallons per minute (gpm). This extracted ground water would be pumped to a pretreatment unit (to be built for this action) and then to the existing wastewater treatment plant operated by Quantum. After treatment, the water would be discharged via the Quantum facility NPDES permitted outfall to the Mississippi River. Spent carbon generated at the pretreatment unit will require special handling for disposal as a hazardous waste.

Landfill Area

In order to control the plume of contamination in the landfill area, it is anticipated that approximately 70 gallons per minute (gpm) extraction capacity would be required in the overburden and bedrock aquifers. The final extraction capacity and placement of extraction wells in the two aquifers will be determined during the remedial design phase.

DAC Area

In the DAC Area, an existing ground water recovery system consisting of a collection trench, wick wells and extraction

wells is in place and operates to extract contaminated ground water from the overburden aquifer. Approximately 20 gpm is extracted using this existing system. Alternative 2 includes an evaluation of the effectiveness of this existing recovery system for the overburden aquifer and delineation of the plume of contamination in the bedrock aquifer. It is anticipated that an additional extraction capacity of 50 gpm in the bedrock and overburden aquifers may be required to control the plume of contamination in the DAC Area.

The remedial design of the Alternative 2 would include collection of additional hydrogeologic data to determine the final number, locations and capacity of the extraction wells to meet the objective of initial control over the plumes of contamination.

Treatment

The existing onsite wastewater treatment facility with a pretreatment unit would be utilized to treat the extracted ground water from the two areas. The existing treatment facility currently has a permitted NPDES discharge to the Mississippi River. The existing wastewater treatment plant is a biological activated sludge plant capable of treating the chlorinated hydrocarbons, PAH compounds and BTEX compounds, which are contaminants of concern for the site.

Based on currently available data, it is appropriate to use pretreatment units such as an air stripper using carbon

absorption overhead treatment or an ultraviolet/oxidation system. These alternatives are discussed in detail in the Focused Feasibility Study report. The final pretreatment option would be selected during the design phase. The pretreatment unit would be designed to remove the chlorinated hydrocarbons and other volatile organics, such as benzene, from the ground water allowing for effective treatment of remaining ground water contaminants at the existing plant. Ground water would continue to be extracted and treated until the ground water achieves the applicable or relevant and appropriate cleanup criteria. These criteria are identified in Table 5-1, Section 5. This treatment system is flexible and may be modified by subsequent response actions at this site.

The EPA has considered treatment utilizing the existing wastewater treatment facility without pretreatment as an alternative. However, based on currently available data, it appears that the wastewater treatment facility without pretreatment may not be able to achieve compliance with all of the applicable or relevant and appropriate requirements (ARARs). In particular, it appears that without pretreatment, the NPDES discharge limits for several contaminants would be exceeded with this alternative. Such an alternative would also allow unacceptable levels of chlorinated hydrocarbons and other volatile organic compounds such as benzene, to be released in the air in the area of the wastewater treatment facility. Therefore,

the Agency prefers the selected remedy which uses the existing plant with pretreatment.

The estimated capital cost for this remedy is approximately $552,000. The estimated annual operation and maintenance cost for this alternative would be approximately $219,600 and total $2,070,000 over thirty years. The estimated total present value of this alternative is $2,622,000. The implementation time for this remedy would be approximately 16 months.

2.3 ALTERNATIVE 3 - EXTRACTION AND TREATMENT AT A NEW WASTEWATER TREATMENT PLANT

This alternative would require the same ground water extraction system as Alternative 2. However, instead of treating the ground water at the existing onsite wastewater treatment plant, Alternative 3 requires the design and construction of a new wastewater treatment plant to treat the ground water. Based on available information regarding the physical and chemical characteristics of the aquifers, an acceptable treatment system for this contaminated ground water would consist of an air stripper followed by a biological sequencing batch reactor followed by a carbon bed polishing unit. This treatment system may be modified or changed during the design phase.

The estimated capital cost of this alternative is $1,140,000. The estimated annual operation and maintenance cost is approximately $353,200 and total $3,329,600 over thirty years.

The estimated total present value of this alternative is $4,469,600. The implementation time for this remedy is approximately 20 months.

3.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The selected remedy for the landfill and DAC areas initial ground water remediation is Alternative 2. As described above, this alternative involves extraction of ground water from the landfill and DAC areas and treatment of the ground water at the existing onsite wastewater treatment plant with pretreatment. Based on currently available information, this alternative provides the best balance of tradeoffs with respect to the nine criteria that EPA uses to evaluate remedial action alternatives. This section provides a summary of each criteria and an analysis of the alternatives under consideration for this operable unit of the Chemplex site. For further information on the nine criteria, refer to EPA Interim Final "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated October 1988.

3.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Protection of human health and the environment is the central mandate of CERCLA, as amended by SARA. Protection is achieved by minimizing risks posed by the site and taking action to eliminate future unacceptable risks to human health and the

environment through any pathway. Each remedial alternative may have different long-term and short-term effects on the protection of human health and the environment.

All of the alternatives evaluated in this operable unit, with the exception of the no action alternative, should provide adequate protection of human health and the environment by reducing and controlling risk through extraction and treatment of ground water, thereby minimizing the potential for further migration of contaminated ground water from this site. The extraction process will remove the contaminants from the ground water and will therefore protect the nearby residents from drinking contaminated ground water. The treatment process will permanently treat, destroy and dispose of the contaminants and the treated ground water will be discharged to the Mississippi River in accordance with NPDES requirements that will be protective of human health and the environment.

3.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Section 121(d) of CERCLA, 42 U.S.C. §9621(d), as amended, requires that remedial actions comply with legally applicable or relevant and appropriate requirements (ARARs) under Federal and State laws. All of the alternatives considered in this operable unit, with the exception of the no action alternative, will comply with the ARARs identified for this operable unit of the site.

The chemical-, location-, and action-specific ARARs for this remedial action are listed in Tables 5-1, 5-2, and 5-3, which are presented in Section 5.2, Attainment of the ARARs.

Regarding the chemical-specific ARARs listed on Table 5-1, it should be noted that the Health Advisory Levels (HAL), Negligible Risk Levels (NRLs), and Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act are considered applicable requirements pursuant to rules adopted by the state of Iowa. Therefore, these levels are the primary cleanup goals. The MCLs are also considered relevant and appropriate requirements based on EPA guidance. Even though this is an operable unit remedial action, treatment of the contaminated ground water will be required until achievement of the cleanup goals for all of the contaminated ground water found at the site in the landfill and DAC areas.

3.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

Long-term effectiveness and permanence address the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

All of the Alternatives referenced herein, except the no action alternative, would have equal effectiveness in providing protection to human health and the environment. This is because both Alternatives 2 and 3 would have ground water extraction systems capable of controlling the plumes in the landfill and DAC

areas and both Alternatives would have treatment systems capable of permanently treating, destroying and disposing of contaminants.

3.4 REDUCTION OF TOXICITY, MOBILITY OR VOLUME

This evaluation criteria relates to the performance of a technology or remedial alternative in terms of eliminating or controlling risks posed by the toxicity, mobility, or volume of hazardous substances.

All of the Alternatives, except the no action alternative, provided for the reduction of toxicity, mobility or volume of contaminants by extraction of the ground water and subsequent treatment. This is because the extraction system for Alternatives 2 and 3 would effectively control the plumes of contamination and therefore would reduce the toxicity, mobility and volume of contaminants impacting the ground water. The treatment system for Alternatives 2 and 3 would then permanently treat, destroy and dispose of contaminants.

3.5 SHORT-TERM EFFECTIVENESS

Short-term effectiveness addresses how well an alternative is expected to perform, the time to achieve performance and the potential adverse impacts of its implementation. The short-term effectiveness of the two alternatives would be essentially the same, because the time it would take to implement the two

alternatives is a difference of only 4 months and there would be no adverse effects for the onsite workers except for the customary risks of construction.

3.6 IMPLEMENTABILITY

Implementability addresses how easy or difficult, feasible or infeasible, an alternative would be to carry out from design through construction, operation and maintenance.

The various components of Alternatives 2 and 3 are proven technologies and materials necessary to implement them should be readily available.

3.7 COST

CERCLA requires that EPA select the most cost-effective (not merely the lowest cost) alternative that protects human health and the environment and meets other requirements of the law. The no action alternative, which would involve no cost, was considered in order to meet requirements of the law. The FS submitted by the PRPs indicates that costs would be incurred for monitoring under the no action alternative. Since additional operable units will be conducted and monitoring will be included, such costs are not presently included in the no action alternative, herein.

Total capital costs are estimated at $552,000 and $1,400,000, for Alternatives 2 and 3 respectively. Table 3-1,

TABLE 3-1

COST ESTIMATES

ALTERNATIVE	IMPLEMENTATION TIME	CAPITAL COST (A)	ANNUAL O&M (B)	ANNUAL O&M 30 YEAR PRESENT WORTH B(9.427)=C	TOTAL PRESENT VALUE A+C
No Action 1	0	0	0	0	0
Alternative 2	16	552,000	219,600	2,070,200	2,622,200
Alternative 3	20	1,140,000	353,200	3,329,000	4,469,600

Assumptions: Interest Rate 10%
Number of years 30
No Major Equipment Replacement

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herein, lists the estimated costs for each alternative evaluated. Present worth operation and maintenance costs (at 10% discount rate) are estimated at $2,070,000 and $3,329,600 for Alternatives 2 and 3, respectively. The total present worth costs are, therefore, estimated at $2,622,000 and $4,469,600 for Alternatives 2 and 3, respectively. These costs were taken directly from the Focused Feasibility Study Report and are presented for comparative purposes. Final costs of the selected remedy will be developed during design.

3.8 COMMUNITY ACCEPTANCE

This evaluation criteria addresses the degree to which members of the local community support the remedial alternatives being evaluated. There were no specific adverse comments from the public related to the remedial alternatives being evaluated or the proposed remedy.

A public meeting was held on August 14, 1989, to present the Proposed Plan and solicit public comment. The public comment period was from July 24, 1989, until August 23, 2989. Significant public comments are addressed in the Responsiveness Summary, attached to this ROD. Other comments that were received are also being responded to.

3.9 STATE ACCEPTANCE

The state acceptance criteria addresses the concern and degree of support that the state government has expressed regarding the remedial alternatives being evaluated. The state has participated in the review of all of the RI/FS documents and in negotiations with the PRPs. The state of Iowa issued a letter of concurrence on the selected remedy dated August 3, 1989. A copy is attached.

4.0 THE SELECTED REMEDY

The selected remedy, Alternative 2 of the Focused Feasibility Study, represents the best balance among the criteria used to evaluate remedies. The selected remedy will protect human health and the environment, attain ARARs, be cost-effective, and utilize permanent solutions employing treatment technologies to the maximum extent practicable.

The selected remedy includes the following:

- Institutional controls to restrict use of ground water until remedial actions achieve cleanup of the contaminated ground water to required levels.

- Extraction of ground water by placement of extraction wells in and around the plumes of contamination in the landfill and DAC areas.

- Pretreatment of the extracted ground water, proper disposal of pretreatment solid wastes in accordance with RCRA.

- Treatment of the extracted and pretreated ground water at the existing onsite wastewater treatment plant.

- Discharge of the treated ground water to the Mississippi River via a federally permitted outfall in accordance with the existing NPDES permit, or modified as necessary.

4.1 RESTRICT USE OF GROUND WATER

Since the concentrations of various contaminants substantially exceed human health and environmental standards in the plumes of ground water contamination from the site, the Agency for Toxic Substances and Disease Registry (ATSDR) recommends that ground water use be restricted at or near the plumes. The Iowa Environmental Quality Act, Iowa Code Ann. §455B, and the Iowa Admin. Code, Chapter 38, require that routine installation of all private water wells be permitted by IDNR or its designee. This authority may be used to restrict installation of wells in the pathway of the plumes. In addition, the landfill is being placed on the Iowa registry of hazardous waste sites by IDNR, which requires placing by the state of a notice on the deed preventing sale of the landfill or change in land use without approval by the state. Deed restrictions are also required for the adjacent property, under which the contaminated ground water plumes are migrating. Such restrictions will be implemented by the state of Iowa or the local government.

4.2 EXTRACTION OF GROUND WATER

The selected remedy includes the placement of extraction wells in the contaminated ground water plumes to control migration. It is anticipated that a total of approximately 140 gpm of extraction capacity will be required to control migration of the plumes in the overburden and bedrock aquifers of the landfill and DAC areas. However, the final extraction capacity and number and placement of extraction wells will be determined during the Remedial Design phase.

4.3 PRETREATMENT OF EXTRACTED GROUND WATER

The selected remedy consists of a pretreatment unit which will be designed to remove approximately 99% of the volatile organic compounds, including chlorinated hydrocarbons and BTEX compounds from the ground water. A viable pretreatment system which has been identified as the preferred design for the selected remedy to be used for pretreatment consists of air stripping with overhead treatment of the vapors by carbon absorption. The design for this type of pretreatment system would include air dispersion modeling which would provide data to calculate a risk assessment for air emissions from the air stripper. This type of pretreatment design could be utilized to meet the objectives of pretreatment. Solid wastes generated from this type of pretreatment unit would be disposed in accordance with RCRA Subtitle C requirements. If the modeling and risk

assessment indicate that overhead treatment is not required, the design may be modified accordingly.

Additional predesign investigations are planned with an emphasis on collection of data which may provide additional information warranting the selection of a different pretreatment system. The final pretreatment system must meet the pretreatment objectives and the nine criteria for selection of remedial actions. See Figure 4-1 for a schematic for the extraction, pretreatment, treatment, and discharge process.

4.4 TREATMENT OF THE EXTRACTED GROUND WATER

After extraction and pretreatment, the ground water will be treated at the existing onsite wastewater treatment plant. The existing treatment plant is a biological activated sludge plant which has been used extensively to treat volatile organic and semi-volatile organic compounds, including the compounds of concern that will remain after pretreatment. This biological activated sludge plant is a proven treatment technology.

Contaminants remaining in the extracted ground water following pretreatment would be diluted following addition to the plant process wastewater stream. Volatilization, adsorption, and biodegradation are the mechanism by which the remainder of the contaminants would be removed from the water to achieve the NPDES permitted discharge levels. The majority of contaminants remaining following pretreatment would be the semi-volatile

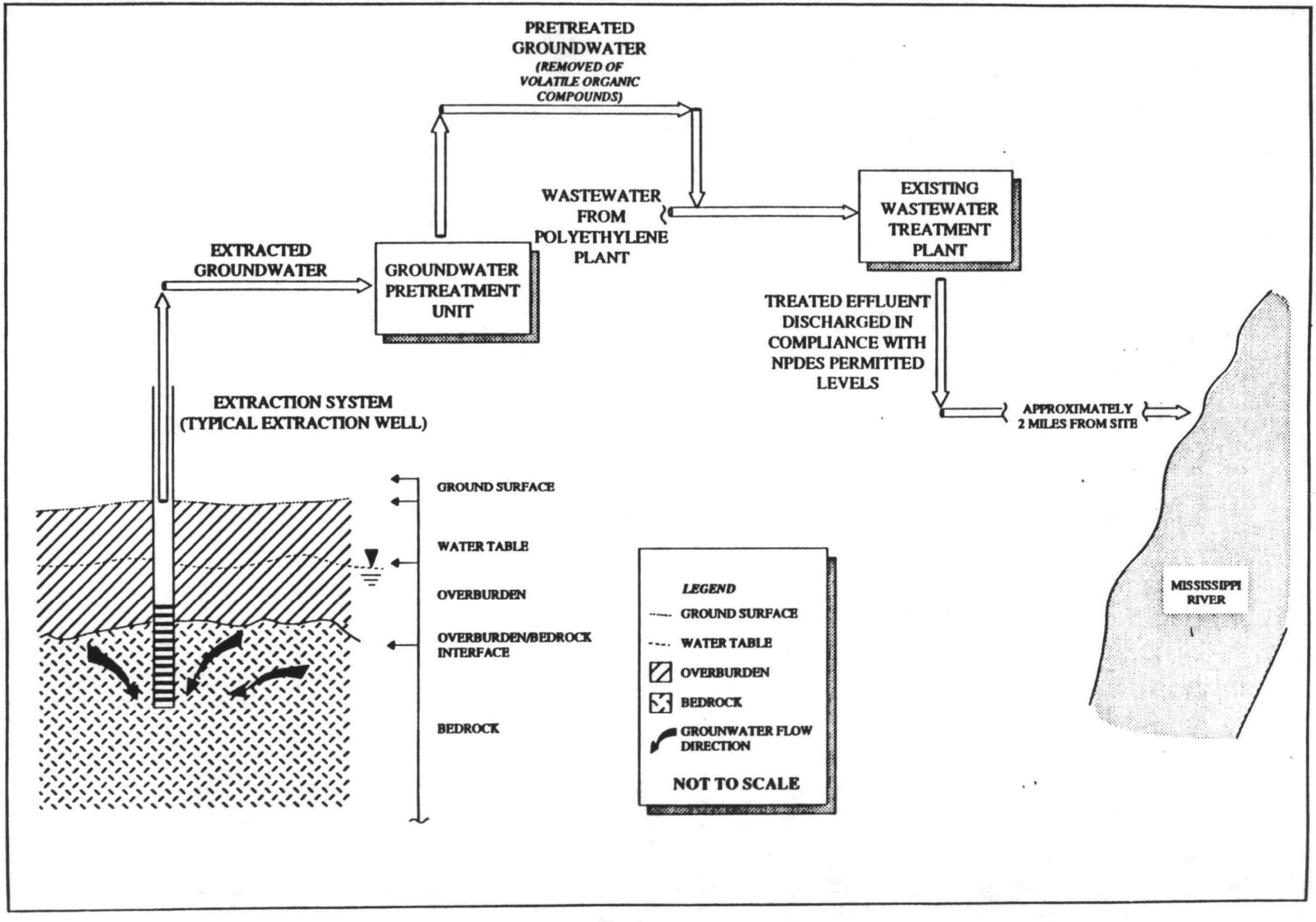

Figure 4-1 **Schematic of Groundwater Extraction, Treatment, and Discharge Process**

organics, which would be biodegraded in the existing onsite wastewater treatment plant. The pretreatment unit in conjunction with the existing treatment plant would achieve compliance with current NPDES permitted effluent limitations.

4.5 DISCHARGE OF TREATED GROUND WATER

The existing onsite wastewater treatment plant effluent is discharged via an NPDES permitted release to the Mississippi River, just upstream of the Upper Mississippi River Wildlife Refuge. The selected remedy requires that approximately 140 gpm of contaminated ground water will be extracted and subsequently treated at the existing treatment plant after pretreatment removes the chlorinated hydrocarbons and other volatile organics, including benzene. Modifications to the existing permit or a new NPDES permit may be required because of the added burden on the wastewater treatment plant from the contaminated ground water. The IDNR will review, monitor and determine if any modifications or a new NPDES permit is required. The responsible parties will apply for such modifications, if necessary. Based on available data, it appears that treatment of the extracted and pretreated contaminated ground water will achieve the effluent limitations of the existing NPDES permit. The selected remedy will achieve appropriate discharge limitations in accordance with the National Pollution Discharge Elimination System (NPDES) requirements and will protect the nearby wildlife refuge. Achievement of the

NPDES requirements and protection of the wildlife refuge and the bald eagles that visit the refuge are goals of the remedial action for this site. The selected remedy for this operable unit is the initial step toward, and is consistent with, providing protection of the wildlife refuge.

5.0 STATUTORY DETERMINATIONS

The selected remedy satisfies the statutory requirements for the degree of cleanup as specified by CERCLA, by extraction and treatment which will permanently treat, destroy, and dispose of ground water contaminants. Section 121 of CERCLA, 42 U.S.C. Section 9621, states that the selected remedy shall:

1) Be protective of human health and the environment;

2) Attain ARARs (or provide evidence showing ARARs cannot be attained);

3) Be cost-effective; and

4) Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The pretreatment system and the biological activated sludge treatment system are permanent treatment technologies that are capable of treating the volatile organic compounds and polynuclear aromatic hydrocarbons in the ground water.

5.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy will provide protection of human health and the environment by extraction, pretreatment and treatment of contaminated ground water from the site. The concentrations of various contaminants in the ground water presently exceed human health and environmental standards and criteria. The extraction of this contaminated ground water initiates control over the migration of the contaminated ground water plumes. Such control will reduce the potential for these plumes to reach downgradient private drinking water wells and will reduce the potential discharge of contaminated ground water to surface waters, thus, protecting aquatic life and wildlife in the vicinity of the site. The selected remedy will discharge the ground water to the Mississippi River at concentrations of contaminants that will be in accordance with the NPDES requirements and will protect the river's aquatic life as well as the downstream wildlife area.

5.2 ATTAINMENT OF THE ARARs

The selected remedy will comply with the chemical-specific Federal and State ARARs for cleanup levels to be attained in the ground water at the site or migrating therefrom. The remedy will be engineered and implemented to meet location-specific and action-specific ARARs.

Chemical-Specific ARARs

The ROD describes the chemical-specific ARARs that this operable unit must achieve in the long-term for remediation of the contaminated ground water in the landfill and DAC areas. Although this is an operable unit remedial action, chemical-specific ARARs are appropriately identified at this time because this remedy may become the final ground water remedy for these areas.

The chemical-specific ARARs for this operable unit are identified in Table 5-1. These ARARs were developed to protect the shallow ground water from further contamination due to BTEX, PAHs and chlorinated hydrocarbons, which emanate from the site. The ground water must be protected because it is a Class II aquifer, which is a current and potential drinking water source.

Table 5-1, Chemical-Specific ARARs, includes the requirements of the Iowa rules for determining cleanup actions at hazardous waste sites, Iowa Administrative Code, Chapter 133 (455B, 455E). These rules are legally applicable to the remedial action to be performed at the Chemplex site for this operable unit. The Iowa Administrative Code, Section 133.2, defines the hierachy of cleanup action levels for remediation of contaminated ground water in Iowa. This hierachy establishes the EPA Health Advisory Levels (HAL) for a contaminant will be the cleanup action level if a HAL exists; if not, the EPA negligible risk

TABLE 5-1
CHEMICAL-SPECIFIC ARARs

						CWA - Water Quality Criteria Protection of Human Health		CWA-Ambient Water Quality/Protection of Aquatic Life
		HAL (ug/l)	NRL (ug/l)	SDWA MCLs (ug/l)	SDWA Proposed MCLs (ug/l)	Water & Fish Ingestion (ug/l)	Fish (only) Consumption (ug/l)	Freshwater Acute/Chronic (ug/l)
BTEX Compounds	Benzene	*	1	5	*	0.66	*	5,300/*
	Toluene	2,000	*	*	2,000	14,000	420,000	17,000/*
	Ethyl benzene	700	*	*	700	1,400	3,300	32,000/*
	Xylenes	10,000	*	*	10,000	*	*	*
Chlorinated Hydrocarbon Compounds	Tetrachloroethylene	10	*	*	5	0.8	8.9	5,200/840
	Trichloroethylene	*	3	5		2.7	81	45,000/21,000
	1,1-Dichloroethylene	7	*	7		3,100	*	11,000/*
	1,2-Dichloroethylene	70	*	*	100	*	*	*
Polynuclear Aromatic Hydrocarbon Compounds (PAH)	Anthracene	*	*	*	*	*	*	*
	Fluorene	*	*	*	*	*	*	*
	Naphthalene	*	*	*	*	*	*	*
	Phenanthrene	*	*	*	*	*	*	*
	Pyrene	*	*	*	*	*	*	*

HAL - Office of Drinking Water Lifetime Health Advisory Level
NRL - Negligible Risk Level for excess 1.00E-06 lifetime cancer risk
SDWA - Safe Drinking Water Act MCL - Maximum Contaminant Level CWA - Clean Water Act
*Standards not specified for compound

Other Chemical-Specific ARARs are listed below.

State Iowa Administrative Code Section 61.2(2), Antidegradation Policy: The quality of the waters of the state should not degrade.

Cleanup level hierachy of HAL, NRL, and MCL.

level (NRL) for carcinogens shall be the cleanup level if one exists; if no HAL or NRL exist, then the EPA enforceable maximum contaminant level (MCL), established pursuant to the Safe Drinking Water Act (SWDA), shall be the action level. If no HAL, NRL or MCL exist, the action level will be established on a case-by-case basis using EPA recommended guidelines and recognized experts. Table 5-1 identifies the existing HAL, NRL, and MCL for the contaminants of concern at the Chemplex site. In accordance with this Iowa rule, the HALs for toluene, ethylbenzene, xylene, 1,1-dichloroethylene and 1,2-dichloroethylene are the applicable actions levels for cleanup of the contaminated ground water for these contaminants. The NRLs are the applicable cleanup action levels for benzene and trichloroethylene. Although a HAL exists for tetrachloroethylene, it is not applicable because the proposed MCL is more stringent than the HAL. Because of this anomaly, the HAL for tetrachloroethylene is relevant and appropriate and the proposed MCL is to be considered in implementation of this remedial action.

In the event that attainment of the HALs or NRLs is not practical, the MCLs and proposed MCLs may become the alternative cleanup levels for any one of the contaminants. This substitution would be in accordance with the Iowa Administrative Code, Section 133.4 (3) b.1, which says that the MCLs and proposed MCLs are relevant and appropriate cleanup action levels for contaminated ground water when HALs and NRLs are impractical

to achieve. The ground water downgradient of the site is used for drinking water without treatment by residents living near the site. Although MCLs and the proposed MCLs would be applicable at the tap for publicly operated water supply systems, these action-levels are relevant and appropriate when the expected and current use of the ground water is for drinking water.

In addition, the rules in Iowa for antidegradation of ground water is relevant and appropriate for this remedial action. The Iowa Administrative Code, Section 61.2 (2) requires that the quality of the ground water in the state shall not be degraded by contamination. This regulation is relevant and appropriate to prevent further degradation of the ground water quality due to migration of the plumes of ground water already contaminated from the site.

At this time, no MCL, HAL or NRL have been established for the PAHs detected in the ground water at the site. Therefore, it is appropriate to establish a site-specific alternative cleanup action level for the PAH contaminants at this site. At other sites with similar ground water contamination, EPA has determined that a cleanup action level of 10 ug/l (ppb), the detection limit, is relevant and appropriate for PAH contamination in ground water. The detection limit is the relevant and appropriate action level for cleanup of the PAH contaminants in the ground water at this site.

Table 5-1 also lists the ambient water quality criteria (AWQC) for the protection of human health and aquatic life as chemical-specific ARARs for this ground water remedy. These AWQC are established pursuant to the Clean Water Act, 33 U.S.C. §§1251, et. seq. These criteria are to be considered in implementing this remedy; however, because the promulgated and proposed MCLs are more stringent, the AWQC are not relevant and appropriate for cleanup of the ground water for this operable unit remedial action. The AWQC are to be considered in the implementation of this action because aquatic life and human health may be affected from the discharge of contaminated ground water from this site to nearby Rock Creek, which flows to a lake and then to the Mississippi River. Fish from the river use the creek and the lake for habitat. The creek discharges to the river just above the Upper Mississippi River Wildlife Refuge. Commercial fishing is allowed in the river just downstream of these areas. There is a threat of ground water contamination migrating from this site to the surface waters. The PRPs submitted to EPA a study of Rock Creek, which indicates no contamination in the creek; however, the study included only one sample of the tributary to the creek, which is adjacent to the site. Analysis of a sample from this tributary contained detectable levels of chlorinated hydrocarbons; therefore, it will be further investigated in the future RI/FS activities at the site. The AWQC are to be considered in implementing the cleanup

of the ground water at this site for the protection of the surface waters at the site.

Although it is possible that this operable unit remedy will become the final remedy for ground water remediation of the landfill and DAC areas, it is also possible that future RODs for this site may modify or effect this remedy. Information to be gathered from future remedial investigations at this site will include an assessment of the need for further ground water remediation. For example, future remedial investigations may disclose new contaminants or may reveal that a greater volume of ground water is contaminated than currently estimated. In the event that new information affects this selected remedy, then future records of decisions may modify this operable unit remedial action. For example, the length of time to pump and treat the ground water may be expanded or additional treatment may be necessary. In addition, future remedial action at the site may include source removal in the landfill and DAC areas, and such remediation may decrease the overall time necessary to pump and treat the contaminated ground water. Nevertheless, the treatment of the extracted ground water in the landfill and DAC areas will continue until ground water contaminated with PAHs, BTEX and chlorinated hydrocarbons is remediated to the levels identified herein as the chemical-specific ARARs. Therefore, it is appropriate to identify the contaminant-specific ARARs at this time.

Location-Specific ARARs

The location-specific ARARs for this operable unit remedial action are identified in Table 5-2. These requirements are based on the location of the site and the effects the site may have on its surrounding environment. Because the site is near the Mississippi River and the Upper Mississippi River Wildlife Refuge (where bald eagles have been located), the standards found in Table 5-2 for the protection of a wildlife refuge, endangered species habitat and fish and wildlife are relevant and appropriate requirements for this operable unit. Because the discharge of treated ground water is directly into the Mississippi River and the contaminated ground water discharges directly to creeks adjacent to the site, which flow to the river, these requirements are relevant and appropriate.

Action-Specific ARARs

The action-specific ARARs for this operable unit remedy are identified in Table 5-3. These ARARs are activity-based requirements or limitations on actions taken with respect to the hazardous substances found on the site. This operable unit remedy includes the treatment of ground water contaminated with BTEX, PAHs and chlorinated hydrocarbons, which is regulated under both the Clean Water ACT (CWA) and the RCRA.

The selected remedy includes the pretreatment of the contaminated ground water using an air stripper and an overhead activated carbon treatment unit. The carbon filters may contain

TABLE 5-2
LOCATION-SPECIFIC ARARs

Location	Requirement	Citation
Critical habitat upon which endangered species or threatened species depends	Action to conserve endangered species or threatened species, including consultation with the Department of the Interior	Endangered Species Act of 1973 (16 U.S.C. Sections 1531 et. seq.); 50 CFR Part 200, 50 CFR Part 402; Fish and Wildlife Coordination Act (16 U.S.C. Sections 661 et. seq.) 33 CFR Parts 320 – 330
Wildlife refuge	Only actions allowed under the provisions of 16 U.S.C. Section 668 may be undertaken in areas that are part of the National Wildlife Refuge System	16 U.S.C. Sections 668 et. seq.; 50 CFR Part 27
Area affecting stream or river	Action to protect fish or wildlife	Fish & Wildlife Coordination Act (16 U.S.C. Sections 661 et. seq.); 40 CFR 6.302

TABLE 5-3
ACTION-SPECIFIC ARARs

Action	Requirements	Citation
Discharge of Treatment System Effluent	Best Available Technology:	
	Use of best available technology (BAT) economically achievable is required to control toxic and nonconventional pollutants. Use of best conventional pollutant control technology (BCT) is required to control conventional pollutants. Technology based limitations may be determined on a case by case basis.	CWA 40 CFR Section 122.44(a)
	Water Quality Standards:	
	Applicable Federally approved State water quality standards must be complied with. These standards may be in addition to or more stringent than other Federal standards under the CWA.	40 CFR Section 122.44 and State regulations approved under 40 CFR Section 131
	Discharge limitations must be established at more stringent levels than technology based standards for toxic pollutants.	40 CFR Section 122.44(e)
	Best Management Practices:	
	Develop and implement a Best Management Practices program to prevent the release of toxic consituents to surface waters.	40 CFR Section 125.100
	The Best Management Practices program must:	40 CFR Section 125.104
	o Establish specific procedures for the control of toxic and hazardous pollutant spills.	
	o Include a prediction of direction, rate of flow, and total quantity of toxic pollutants where experience indicates a reasonable potential of equipment failure.	
	o Assure proper management of solid and hazardous waste in accordance with regulations promulgated under RCRA.	

TABLE 5-3 (continued)

Action	Requirements	Citation
Discharge of Treatment System Effluent (continued)	Monitoring Requirements: Discharge must be monitored to assure compliance. Discharge will monitor: o The mass of each pollutant o The volume of effluent o Frequency of discharge and other measurements as appropriate	40 CFR Section 122.41(l)
	Approved test methods for waste constituent to be monitored must be followed. Detailed requirements for analytical procedures and quality controls are provided. Sample preservation procedures, container materials, and maximum allowable holding times are prescribed.	40 CFR Section 136.1-136.4
	Comply with additional substantive conditions such as: o Duty to mitigate any adverse effects of any discharge; and o Proper operation and maintenance of treatment systems.	40 CFR Section 122.41(l)
Treatment, Storage, and Disposal of Solid Wastes from Wastewater Treatment Plant	Subtitle C and D of RCRA, guidelines and requirements for the treatment, storage, and disposal of solid wastes.	Sections 3001 et. seq. of RCRA, 42 U.S.C. Sections 6901 et. seq.

Other Action-Specific ARARs are listed below.

Federal: 20 CFR Sections 1904, 1910, and 1926, OSHA Worker Protection Standards: Health and safety requirements for workers involved in remedial actions.

State: Iowa Code Annotated (I.C.A.) Sections 455B.171 et. seq., Water Quality; I.C.A. Sections 455B.211 et. seq., Water Treatment;
I.C.A. Sections 455B.301 et. seq., Solid Waste Disposal;
I.C.A. Sections 455E.1 et. seq., Groundwater Protection; I.C.A. Section 455B.131 et. seq., Air Quality;
Iowa Administrative Code, Chapter 60, Iowa Water Pollution Control Regulations: Analgous to federal discharge regulations;
Iowa Administrative Code, Chapter 38, and I.C.A. Section 455B.187, Water well construction regulations: Water well construction must be registered and permitted.

hazardous wastes and will be disposed in accordance with Subtitle C requirements of RCRA. The source of these hazardous wastes is the contaminated ground water, which seems to be contaminated from the disposal of chlorinated hydrocarbons, such as TCE and PCE, in the landfill. Although the disposal of chlorinated hydrocarbons in the landfill has not been confirmed, these hazardous substances were found in the contaminated ground water emanating from the landfill and chlorinated solvents were used at the facility. The chlorinated hydrocarbons found at the site contain hazardous constituents and are sufficiently similar to hazardous wastes that the RCRA requirements will be relevant and appropriate for disposal of the filters from the pretreatment of the contaminated ground water.

After pretreatment the contaminants remaining in the ground water will be treated in the existing onsite wastewater treatment plant, which has an NPDES permitted discharge to the Mississippi River. Because this discharge is offsite, the NPDES permit requirements are legally applicable requirements for this remedy. Table 5-3 identifies the NPDES requirements established under the CWA and the Iowa Water Quality laws and regulations. The existing NPDES permit limitations are to be considered in the implementation of this remedy. In the event that the existing permit is modified upon review by IDNR or EPA, such modified permit would be a legally applicable requirement for this remedial action.

The selected remedy will include construction and other activities such that workers will be onsite implementing the remedy. OSHA Worker Protection Standards are applicable requirements for this action. OSHA standards are also applicable to protect workers from air emissions from the ground water treatment and pretreatment units because workers will operate and maintain these units.

The state of Iowa regulates the construction of private water wells, Iowa Admin. Code, Chapter 38. Such regulations are an important institutional control and are legally applicable. The State of Iowa will prevent construction of such wells on the site and in the vicinity of the ground water contamination until the remediation of the ground water is complete.

5.3 COST-EFFECTIVENESS

The selected remedy is cost-effective. See Table 5-4 for estimated cost of the selected remedy. It provides overall effectiveness proportional to its costs such that the remedy represents a reasonable benefit for the cost expenditures. The selected remedy will provide a reduction in the contaminants of concern in the ground water. The selected remedy is less expensive than the other alternatives evaluated, except for the no action alternative. Utilization of the existing wastewater treatment plant as part of the selected remedy provides a

TABLE 5-4

SUMMARY OF COSTS FOR ALTERNATIVE 2

Alternative 2

Extraction and Treatment using an Air stripper followed by Existing Wastewater Treatment Facility

1.	Non-Construction Costs	
	Engineering/Construction Design and Supervision	56,000
	Contingencies	56,000
	Permitting	15,000
	Subtotal 1	$127,000
2.	Component Installation Costs	
	Extraction System	$267,000
	Air stripper	20,000
	Carbon (GAC) Unit for Air (2 units)	20,000
	Heater/Blower/Dehumidifier	10,000
	Building/Slab	30,000
	Tanks	10,000
	Pumps	10,000
	Subtotal 2	$367,000
3.	Non-Component Costs	
	Electrical/Instrumentation	$ 43,000
	Site Preparation	15,000
	Subtotal 3	$ 58,000
	Total Capital Cost	$552,000

cost-effective alternative to the alternative of building a completely new wastewater treatment plant.

5.4 UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT (OR RESOURCE RECOVERY) TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE/PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

The selected remedy will permanently treat, destroy, and dispose of contaminants found in the ground water by extraction and treatment of ground water. The selected remedy is protective of human health and the environment.

The air stripper with overhead treatment removes the majority of volatile organic contaminants, which would be stripped from the extracted ground water and adsorbed onto activated carbon. The spent carbon containing the contaminants would then be disposed of or recycled offsite in accordance with RCRA Subtitle C. The remaining contaminants would then be treated in the existing plant by volatilization, adsorption, and biodegradation. The majority of contaminants remaining following pretreatment would be semi-volatile organics. The majority of these compounds would be destroyed by biodegradation in the existing wastewater treatment plant. The pretreatment unit in conjunction with the existing treatment plant would achieve compliance with current NPDES permitted effluent limitations.

5.5 SIGNIFICANT CHANGES

Two significant changes which have been incorporated into this ROD that were not discussed in the Proposed Plan and RI/FS reports. These changes have to do with ARARs that affect the performance of this remedial action.

The first change is in regard to the new administrative regulations established by the state of Iowa that became effective on August 16, 1989. According to the Iowa Admin. Code, Chapter 133, the hierachy of ground water cleanup action levels have been established as the Health Advisory Level, the Negligible Risk Level, and the MCL. The rule was not effective at the time the Proposed Plan and RI/FS were available for public comment. EPA considers the IDNR action levels to be applicable requirements for ground water cleanup and listed these levels on Table 5-1, Chemical-Specific ARARs, herein.

Second, in regard to the PAH contaminants, EPA believes that the detection limit of 10 ug/l is an acceptable action level for the PAH compounds found at this site. EPA has used 10 ug/l as a ground water cleanup value at other superfund sites. This is also discussed in Section 5.2, Attainment of ARARs, herein.

RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION

1.1 OVERVIEW

The Proposed Plan, RI/FS Reports and Administrative Record were available for public comment from July 24 through August 23, 1989. A public meeting was also held on August 14 in the Clinton, Iowa City Hall. Comments received from the local community, both in writing and during the public meeting, were directed toward issues involving the effect of the site on human health and the environment in general and not on the remedial alternatives presented in the Proposed Plan. The transcript from the public meeting is available with the administrative record. The local community, therefore, did not express a preference nor indicate any adversity to EPA's preferred Alternative 2. The potentially responsible parties (PRPs), however, indicated that they would prefer that the selection of either Alternative 2 or 3 be postponed until the design phase.

1.2 BACKGROUND ON COMMUNITY INVOLVEMENT

As part of the community relations process, which included interviews of the local community and preparation of a Community Relations Plan, several major community concerns were identified.

The Chemplex site is located in a rural area, approximately 5 miles west of the cities of Clinton and Camanche, Iowa. In addition, another NPL site, the DuPont/Todtz Landfill Site, is located approximately one mile from Chemplex. Therefore,

citizens who live in the surrounding area have expressed concern that the proximity of the sites to their property has caused their property values to decline.

The local community also expressed concern regarding adverse impacts that the two sites, as well as other industries in the community, might have on their drinking water wells and air quality. Some of the members of the local community had concerns regarding the concentrations of contaminants in their drinking water wells and the potential adverse health effects from drinking ground water that had concentrations exceeding federal standards.

Response: During the public meeting, several of these concerns were raised and EPA responded to them.

Regarding the potential decline of property values and the effect of contamination on an individual's property, the individual may pursue a private action against the company causing this contamination. This is discussed on page 46 of the Public Meeting transcript.

Regarding the citizens' concerns of the nature and extent of contamination, EPA made the following points during the meeting:

The operable unit remedy is the first step in dealing with the problem that exists at the Chemplex site. This will accomplish extraction and treatment of the contaminated ground water plumes in the landfill and DAC areas to control the plumes of contamination. Further remedial actions will be undertaken to

deal with the landfill and DAC areas soils and wastes as well as further ground water extraction and treatment.

The Resource Conservation and Recovery Act (RCRA) was enacted to control the generation, transport and management of hazardous wastes. As a result, there has been a minimization of the amount of waste that is being generated at this site. This is discussed on page 48 of the Public Meeting transcript.

Regarding the ground water contamination in the landfill and DAC areas, the concentrations of contaminants, such as benzene and trichloroethylene, exceed human health and environmental standards and criteria (such as MCLs) in the ground water plumes of contamination. The plumes of contamination have been initially defined. Also, analytical results from samples collected from drinking water wells at the closest residences in the downgradient plume direction indicate that these residential wells are not contaminated. Therefore, no individuals are presently drinking contaminated ground water from these plumes.

One of the local citizens expressed a concern that TCE has been detected in her drinking water well at 5 ppb, which is the MCL value. At the meeting, Dan Harper of ATSDR discussed the significance of ingesting ground water at this concentration and the basis of the MCL value. Mr. Harper stated that ingesting water at this level is expected to cause an additional one in 100,000 cancer risk during a lifetime exposure (70 years) to TCE at a concentration of 5 ppb. The effect of the additional

increase of cancer risk should, therefore, not be a problem over a period of several weeks or several years. This response is discussed further on page 29 of the Public Meeting transcript.

1.3 SUMMARY OF PUBLIC COMMENTS AND LEAD AGENCY RESPONSES

The following comments were received on the Proposed Plan and RI/FS Reports. The first set of comments are from potentially responsible parties for the site:

1. Regarding number and placement of extraction wells and extraction capacity in the overburden and in the landfill area, and bedrock aquifers in the DAC areas, the PRPs suggest that not enough information is available to determine the number and placement of extraction wells and extraction capacity in these two areas.

Response: The Proposed Plan acknowledged that the final number, locations, and extraction capacity of the wells would be determined during the design phase. Additional information will be developed during the remedial design to determine the number, location and capacity of the extraction wells.

2. The Focused Feasibility Study used inappropriate treatment systems for a comparative analysis of alternatives.

Response: See response to #3 below.

3. There is no basis in the administrative record for preselecting either a pretreatment unit in series with the existing plant or a new treatment plant.

Response: The Focused FS clearly indicates that collection of additional data during remedial design may indicate that the proposed alternative may be modified. This provides flexibility to utilize data obtained during the Remedial Design phase to reevaluate the remedial action, if necessary.

The Phase II RI/FS prepared by the PRPs concluded that the extracted ground water should be treated using the existing wastewater treatment plant only. It was determined by the Agency that elevated levels of volatile organics (specifically tetrachloroethylene and benzene) would cause increased plant air emissions and potentially would cause exceedance of the existing NPDES permitted effluent levels. Due to the fact that the Phase II RI/FS failed to consider the effect of the elevated levels of volatile organics and the effect of these compounds on the performance of the existing plant, the Focused FS was undertaken to evaluate treatment systems to take into account the elevated levels of volatile organics in the ground water. It is also important to emphasize that the treatment systems for pretreatment and a new plant were selected to provide a basis for comparison of alternatives. The Focused FS clearly indicates that additional investigation work may provide additional information which would warrant the modification of the selected remedial alternative.

The PRPs also stated in their comments that "the means to accomplish treatment cannot be determined at this time," however,

the Phase II RI/FS makes the determination that it is appropriate at this time to treat the extracted ground water by using the existing plant only.

The Focused FS established a design basis in which to evaluate all the alternatives based on available data. It was estimated based on the current understanding of the hydrogeologic system that the extraction and treatment of approximately 140 gpm from the two areas would be required to meet the objective of the operable unit ground water remedy of controlling the plumes of contamination. It is important to emphasize that the alternatives were evaluated using this established design basis and the Focused FS clearly indicates this. The Phase II RI/FS used a similar design basis to recommend treatment at the existing plant only. The PRPs state in their comments that "it is premature to select pretreatment rather than the construction of a new treatment facility," however, they did not similarly consider it premature to recommend treatment at the existing plant only as opposed to a new plant.

The Agency believes that sufficient information is available in the administrative record to conclude that treatment at the existing plant only will not be adequate treatment. In addition, the Agency believes that pretreatment is required if the existing plant is to be used to treat extracted ground water. If significant information is discovered during remedial design that indicates the existing plant will not have the capacity to handle

the additional load, the selected remedy may be modified and EPA may reevaluate the remedial action. This was clearly indicated in both the Proposed Plan and the Focused FS.

4. The PRPs suggested that MCLs are not legally applicable nor relevant and appropriate ARARs for this operable unit remedial action. The PRPs also state that this is an "interim" ground water remedy.

Response: The MCLs promulgated under the federal Safe Drinking Water Act (SDWA) were established for protection of human health. The MCLs are legally applicable to regulate water supply systems for 25 people or more. In accordance with EPA guidance, MCLs are relevant and appropriate cleanup requirements for ground waters at sites that are a current and/or potential source of drinking water. At the Chemplex site, the aquifers are current and potential sources of drinking water.

This operable unit ground water remedy is not an "interim" remedy but it is the first stage of the remedial process for the Chemplex site. Additional remediation may include cleanup of the soils and wastes on the Chemplex site as well as additional ground water remediation. The MCLs as goals are relevant and appropriate.

5. The PRPs commented that the Clean Air Act regulations are not legally applicable or relevant and appropriate requirements for ground water treatment.

Response: The EPA agrees that the Clean Air Act (CAA) is not an ARAR for this site. However, this remedy must meet the nine criteria for selection of a remedy. The most important of the nine criteria is protection of human health and the environment. Therefore, air dispersion modeling and a risk assessment will be conducted for any treatment unit that might release hazardous substances into the air.

Concern with protection of human health and the environment for the air pathway of exposure has prompted federal and state agencies to propose air regulations. Therefore, both federal and state air regulations for wastewater treatment units may be promulgated in the future.

6. The Focused Feasibility Study does not mention or consider the institutional control on ground water use provided by the Iowa Environmental Act.

Response: The Iowa Environmental Act was included as an ARAR in the Proposed Plan and is included as an ARAR in the ROD.

7. Two of the potential ARARs listed in Table 2 of the Focused Feasibility Study do not appear to be appropriate for this site: the Endangered Species Act and the Wildlife Refuge System restrictions.

Response: The location-specific ARARs for this operable unit are identified in Table 5-2. These requirements were selected based on the location of the site and the effects the site may have on its surrounding environment. Because the site

is near the Mississippi River and the Upper Mississippi River Wildlife Refuge (where bald eagles have been located), the standards found in Table 5-2 for the protection of wildlife refuge, endangered species habitat and fish and wildlife are relevant and appropriate requirements for this operable unit. These requirements may not be legally applicable because the discharge of treated ground water is to the Mississippi River (not directly to the Wildlife Refuge). Nevertheless, these requirements are relevant and appropriate.

8. The PRPs commented that Table 4 of the Focused Feasibility Study states that there is "no reduction in risk" under the no action alternative. However, as previously stated, there is presently no known exposure via ingestion or ground water contaminated from the site.

Response: Both the RI/FS and EA Reports prepared by the PRPs did not address the potential risk from ingestion of ground water, which is a drinking water source. The no action alternative would not contain any provisions to control the contaminant plumes. Therefore, residents near the site in the direction of ground water flow could some day be drinking ground water as contaminated as the plumes if the no action alternative is incorporated. Even if institutional controls are implemented with the no action alternative, this would not be responsive because the plumes could still migrate to the residential wells.

The statement that..."there is no reduction in risk under the no action alternative" is correct.

9. The PRPs commented that an NPDES permit would not necessarily be required for the discharge of treated ground water because the discharge is near the site.

On pages 4, 10, and throughout the document, the Focused Feasibility Study states that an NPDES permit would be required for a new treatment plant built at the site. According to Section 121(e) of CERCLA, "No Federal, State or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite..." the preamble to Subpart E of the proposed NCP (53 FR 51394) says that EPA's interpretation of "onsite" further includes situations where the remedial activity occurs entirely onsite but the effects of such activity cannot be strictly limited to the site. For example, a direct discharge of CERCLA wastewater would be an onsite activity if the receiving water body is in the area of contamination or is in very close proximity to the site, even if the water flows offsite. An actual NPDES permit may not be required; rather, only the substantive requirements of the discharge permit may have to be met.

Response: It should be noted that Tables E1 and E6 of the Executive Summary of the PRP's Phase II Remedial Investigation: Volume II, state that the "Clean Water Act: discharge of treated ground water to surface water must meet NPDES limits". The

discharge is presently regulated under the NPDES program and it is an offsite discharge. The exception to this rule, set forth in Section 121(e) of CERCLA, 42 U.S.C. §9621(e), applies only to onsite discharges. Finally, the interpretation of "onsite" action recited in the comment is from the proposed NCP, which has not been promulgated.

10. The Focused Feasibility Study drew conclusions regarding pretreatment limits and the effectiveness of treatment from extremely limited data on the nature of process wastewater.

Response: We recognize that the concentrations of 1000 ppb for benzene and 10,000 ppb naphthalene are based on a one time event and may not reflect fluctuations in the composition of industrial wastewater. This is the best information available at this time in regard to calculation of estimated effluent concentrations. In addition, it is important to note that Quantum does have a plant wide commitment to keep the benzene concentrations in the influent wastewater to no greater than 1000 ppb. The use of the 1000 ppb should provide a conservative estimate of the benzene concentrations in the influent. In conclusion, the calculations regarding pretreatment limits are accurate and are based on the best available information.

11. The PRPs commented that the Focused Feasibility Study discussed several design points which can be addressed more appropriately and completely during remedial design including effluent limits for pretreatment.

Response: A pretreatment system should be able to remove 99% of the volatile organic compounds which would likely be below the concentrations in the process wastewater from Quantum. In any event, neither the Proposed Plan or ROD specify that a pretreatment unit must achieve concentrations lower than the influent to the wastewater treatment plant from Quantum. The effluent limits for pretreatment will be more fully addressed during the design phase.

The following comments were received from the local citizens during the public meeting.

1. During the Public Meeting, one member of the local community expressed concern regarding the length of time (five years) from when the site was proposed for the NPL until the start of cleanup, which is just to begin.

Response: EPA explained during the Public Meeting that there is a priority system established for responding to Superfund Sites. There is limited money and resources to be able to respond to all of these sites at once. Refer to page 38 of the Public Meeting transcript for more explanation.

2. One of the local citizens asked whether the drawdown caused by the proposed extraction wells would influence the amount of water available for the surrounding drinking water wells.

Response: There will still be sufficient water available for drinking water purposes. For more discussion, refer to page 40 of the Public Meeting transcript.

3. One of the local citizens asked if the NPDES discharge was ever monitored by EPA.

Response: The water from the NPDES discharge is monitored by the Iowa Department of Natural Resources (IDNR). The NPDES program has been delegated to IDNR by EPA.

4. One of the local citizens had a question regarding the water quality of the drinking water supply wells located at the Quantum Chemical Company (formerly Chemplex) plant.

Response: The EPA responded that the water supply wells are much deeper than the contaminated ground water plumes, and, therefore, did not anticipate that the water supply wells would be contaminated. Bob Schuler of Quantum also responded that the water supply wells have been sampled and that the analysis indicate that the water supply wells were not contaminated. These responses are listed on page 53 and 54 of the Public Meeting transcript. It should be noted that this ground water operable unit remedy should prevent migration to the deeper aquifers.

5. One of the local citizens asked if the fractures in the bedrock could cause the monitoring to be ineffective in detecting some of the contamination.

Response: The monitoring wells are screened to cover a large area as opposed to one particular element of the ground water. Also, the fractured bedrock hydrogeology is taken into account for placement of monitoring wells and extraction wells. Therefore, the EPA is satisfied that the extraction wells will be placed to prevent contamination from migrating further. This is also discussed on pages 56 and 57 of the Public Meeting transcript.

6. One of the local citizens asked when the Remedial Action (placement of extraction wells) would begin.

Response: The EPA anticipates that additional monitoring wells to delineate the extent of contamination can begin in fall 1989 and that the extraction and treatment process will start during the next construction season. Refer also to page 65 and 66 of the Public Meeting transcript.

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STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

August 3, 1989

Hazardous W
Information
US EPA Regi
Philadelphia

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REME SECTION

Nancy J. Johnson, P.E.
US EPA, Region VII
Superfund Branch
726 Minnesota Avenue
Kansas City, KS 66101

Dear Nancy:

We have reviewed the proposed plan for the Chemplex Superfund site near Clinton, Iowa. The department is familiar with this site and has previously participated with you in discussions about remedies at the site. The proposed plan is recognized to be the first step in the remedial effort at this site. The implementation of this first step should be effective in controlling the release of groundwater contaminants from the site. We agree that these interim measures should be implemented while additional studies are performed to complete the necessary remedial work at the site. It is noted that the existing waste water treatment plant will be used to treat groundwater contaminants. It will be necessary for the company to provide notice to the DNR Wastewater Permits Section of the impacts and additional discharges, if any, that will result from treating the contaminated groundwater. Upon receipt of this notice the department can determine if there will be a need for an amendment to the NPDES permit. If the treatment process releases significant volatile air contaminants, the Air Quality section will also need to review emissions to determine if air emission controls are necessary. We believe that these details can be resolved during remedial design and will not impede the implementation of the selected alternative.

We believe that the recommended alternative is an appropriate initial action to respond to this site and support its implementation while the final remedy is being developed. We thank you for this opportunity to comment. If you have any questions, please contact me at 515/281-4968.

Sincerely,

Morris L. Preston, P.E.
Supervisor
SOLID WASTE SECTION

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