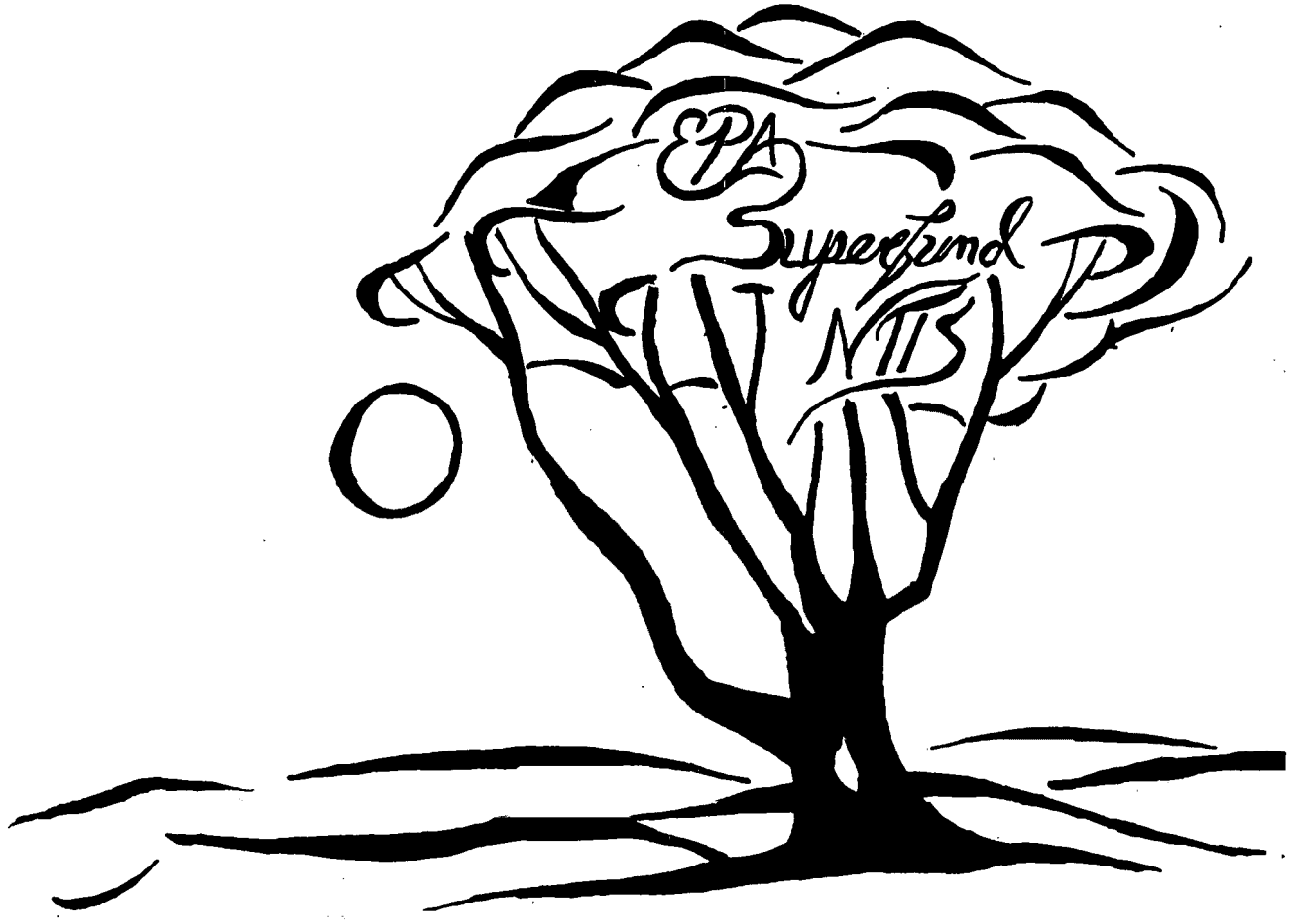
PB94-964313
EPA/ROD/R07-94/074
December 1994

EPA Superfund Record of Decision:

Valley Park TCE Site,
Wainwright Operable Unit, MO
9/29/1994



RECORD OF DECISION

VALLEY PARK TCE SITE

WAINWRIGHT OPERABLE UNIT

VALLEY PARK, MISSOURI

PREPARED BY:

U.S. Environmental Protection Agency

Region VII

Kansas City, Kansas

SEPTEMBER, 1994

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Valley Park TCE Site
Wainwright Operable Unit
Valley Park, Missouri

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Wainwright Operable Unit (WOU) of the Valley Park TCE Site (Site) in Valley Park, Missouri chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Contingency Plan, 40 C.F.R. Part 300. This decision is based on the Administrative Record file for the WOU of the Site.

The State of Missouri concurs on the selected remedy. A letter from the State of Missouri stating its concurrence is included in this Record of Decision (ROD) package.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the WOU of the Valley Park TCE Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

The selected remedy is intended to be a final response action for the WOU but only an interim action for the Site, and addresses all contamination associated with the principal threats posed by the WOU. Specifically, the selected remedy addresses the volatile organic compound (VOC), metals and polynuclear aromatic hydrocarbon (PAH) contamination identified in the soil and the ground water on the WOU only. In the near future, a final operable unit for the larger Site will address the threat posed by the ground water contamination located outside the WOU.

The major components of the selected remedy include:

- Soil vapor extraction (SVE) will be conducted throughout the identified areas of VOC contaminated soil on the WOU. SVE shall be conducted until VOCs are

reduced to concentrations below the performance standards based on the threat to ground water;

- Limited excavation of surface soils contaminated with VOC and/or PAH levels exceeding the direct contact soil performance standards would be addressed in the following manner:

    1. VOC-contaminated surface soils located on the Wainwright property would be covered to prevent contact without excavation occurring. At least a four inch layer of gravel was assumed for cost estimating purposes. An uncontaminated soil cover could be used instead of gravel if mixing of the uncontaminated soil with contaminated soils would not complicate the remedial action. The contaminated surface soils must achieve the direct contact performance standards within five years from startup of the SVE system. If performance standards are not achieved within five years, a one foot depth of the original contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. The excavation would be backfilled to the original grade and revegetated consistent with the existing property;

    2. PAH contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. All PAH contaminated surface soils would be excavated until direct exposure performance standards could be met. For cost estimating purposes, it was assumed a one foot deep excavation would be required. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property.; and,

    3. VOC and PAH contaminated surface soils located on the WOU but off the Wainwright property would be excavated to one foot below surface and taken to a treatment facility off the WOU. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property.

For cost estimating purposes, it was estimated that 95 cubic yards of soil would require excavation and treatment. The technology identified for soil

treatment at the hazardous waste treatment facility off the WOU is low temperature thermal desorption. This technology is assumed for cost estimating purposes. The final treatment technology selected for the excavated soil may change depending on the facility selected and is subject to MDNR and EPA approval;

- A ground water extraction and treatment system which will hydraulically control the impacted ground water throughout the entire vertical section of the aquifer underneath the WOU will be implemented. The extraction system will include at least one extraction well located on the WOU. Air stripping technology will be used to treat the extracted, contaminated ground water. The treated water will be discharged to the Metropolitan Sewer District POTW serving the City of Valley Park;

- An air sparging system would be installed to inject compressed air into the ground water below the area directly north of and beneath the Wainwright building. If lateral vapor migration to horizontal conduits can not be controlled using SVE, the air sparging technology will not be included in the remedial action;

- A deed restriction would be placed on the WOU by the property owners to prohibit the installation and operation of ground water supply wells on the WOU;

- Ground water monitoring would be conducted to assess the effectiveness of the remediation; and,

- Ambient air samples from the interior of buildings on the WOU will be analyzed for WOU contaminants during the remedial design. MDOH health-based ambient air criteria will be used to determine the need for remedial actions to prevent unacceptable ambient air inhalation exposure risks.

STATUTORY DETERMINATIONS

The selected remedy for the WOU is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the interim action for the Site, and is cost-effective. Although this interim action for the Site is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action utilizes treatment and thus is in furtherance of that statutory mandate. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this

remedy, will be addressed by the final response action for the Site.

This remedy will result in hazardous substances remaining on the Site above health-based levels. As a result, a review will be conducted to ensure that the interim action for the WOU continues to provide adequate protection of human health and the environment within five years after commencement of the interim action. Because this is an interim action ROD, review of this Site and of this remedy will be continuing as EPA continues to develop final remedial alternatives for the Site.

for

Dennis Grams, P.E.
Regional Administrator
U.S. EPA, Region VII

9/29/94
Date

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF THE DIRECTOR
P.O. Box 176 Jefferson City, MO 65102-0176 (314) 751-4422

SEP 21 1994

Mr. Dennis Grams
Regional Administrator
U.S. Environmental Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, KS 66101

Dear Mr. Grams:

The MDNR (Missouri Department of Natural Resources) concurs with the ROD (Record Of Decision) for the Valley Park TCE Site - Wainwright Operable Unit as presented by the U.S. Environmental Protection Agency. The ROD was based on the Proposed plan which MDNR developed. MDNR supports the remedial actions described in the ROD for the Wainwright Operable Unit of the Valley Park TCE Site entered on the National Priorities List in Federal Register Volume 51, Number 111, Page 21091, Group 10.

If you have any questions, or if I can be of further assistance in this matter I can be reached at (314) 751-4422.

Very truly yours,

MISSOURI DEPARTMENT OF NATURAL RESOURCES

David A. Shorr
Director

DAS:ES:dml

RECORD OF DECISION

DECISION SUMMARY

VALLEY PARK TCE SITE

WAINWRIGHT OPERABLE UNIT

VALLEY PARK, MISSOURI

PREPARED BY:

MISSOURI DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

JEFFERSON CITY, MISSOURI

ON BEHALF OF:

U.S. Environmental Protection Agency

Region VII

Kansas City, Kansas

SEPTEMBER, 1994

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SECTION 1.0 SITE NAME, LOCATION, AND DESCRIPTION

The Wainwright Operable Unit (WOU) includes an area within and adjacent to property owned by Wainwright Industries, Inc. (Wainwright) located in Valley Park, Missouri described below. The WOU is part of a larger site, known as the Valley Park TCE site.

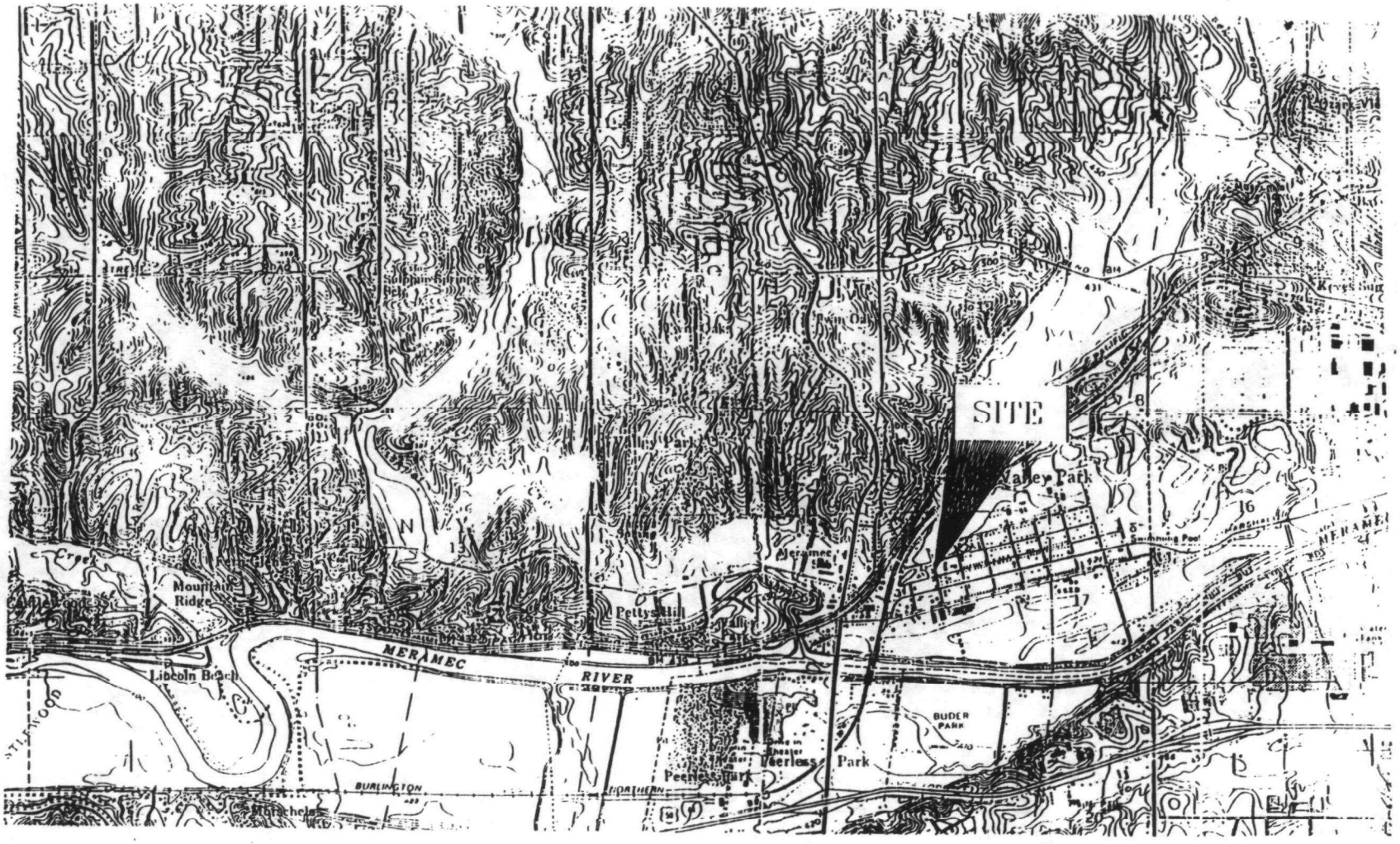
The WOU is located in the downtown area of the city of Valley Park, Missouri as generally shown in Figure 1. The city of Valley Park is located in the southwest portion of St. Louis County. Referring to the shaded portion of Figure 2, the WOU consists of the following city lots within city block #20: 1) nine city lots (7, 8, 9, 10, 11, 20, 22, and 23) located at 220 and 224 Benton Avenue and 219 and 233 Vest Avenue owned by Wainwright Industries, Inc. and used for industrial purposes, 2) two city lots (15 and 16) located at 318 3rd Street owned by Jack and Mary Cotton, 3) the three city lots (12, 13 and 14) located at 314 3rd Street owned by Bennett and Anne Netzer, and 4) the three city lots (4, 5 and 6) located at 218 Benton Avenue owned by Richard and Patricia Menley. Lots 12 through 14, and 15 and 16 are used for residential purposes. St. Louis Boat & Canoe Company operates a business on the Menley property at 218 Benton Avenue. The WOU is bordered on the north by Vest Avenue, on the east by 3rd Street, on the south by Benton Avenue and on the west by commercial properties. The sources of contamination originated and continue to exist on the Wainwright properties. The above listed commercial and residential properties located adjacent to the Wainwright property are included in the definition of the WOU to facilitate the potential need to conduct remedial activities on those properties as part of the remedial action for the WOU.

The WOU is located in the floodplain of the Meramec River, which flows from west to east approximately $^1/_4$ mile to the south. The northeast flank of the Ozark Plateau is located approximately $^1/_4$ mile to the northwest. Valley Park is located on the western edge of a large suburban area surrounding the City of St. Louis which is located ten miles to the east.

SECTION 2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 Site History

Wainwright has owned the property at 224 Benton Avenue since 1947. Wainwright operated a metal stamping and tool and die shop at the facility until 1979. Part of the manufacturing process included a solvent degreasing system that used the solvents trichloroethylene (TCE) from 1963 to 1970 and perchloroethylene (PCE) from 1970 to 1979.



Source Kirkwood and Manchester Quadrangles
Missouri
7.5 Minute Series (Topographic)

VALLEY PARK VICINITY
VALLEY PARK, MISSOURI

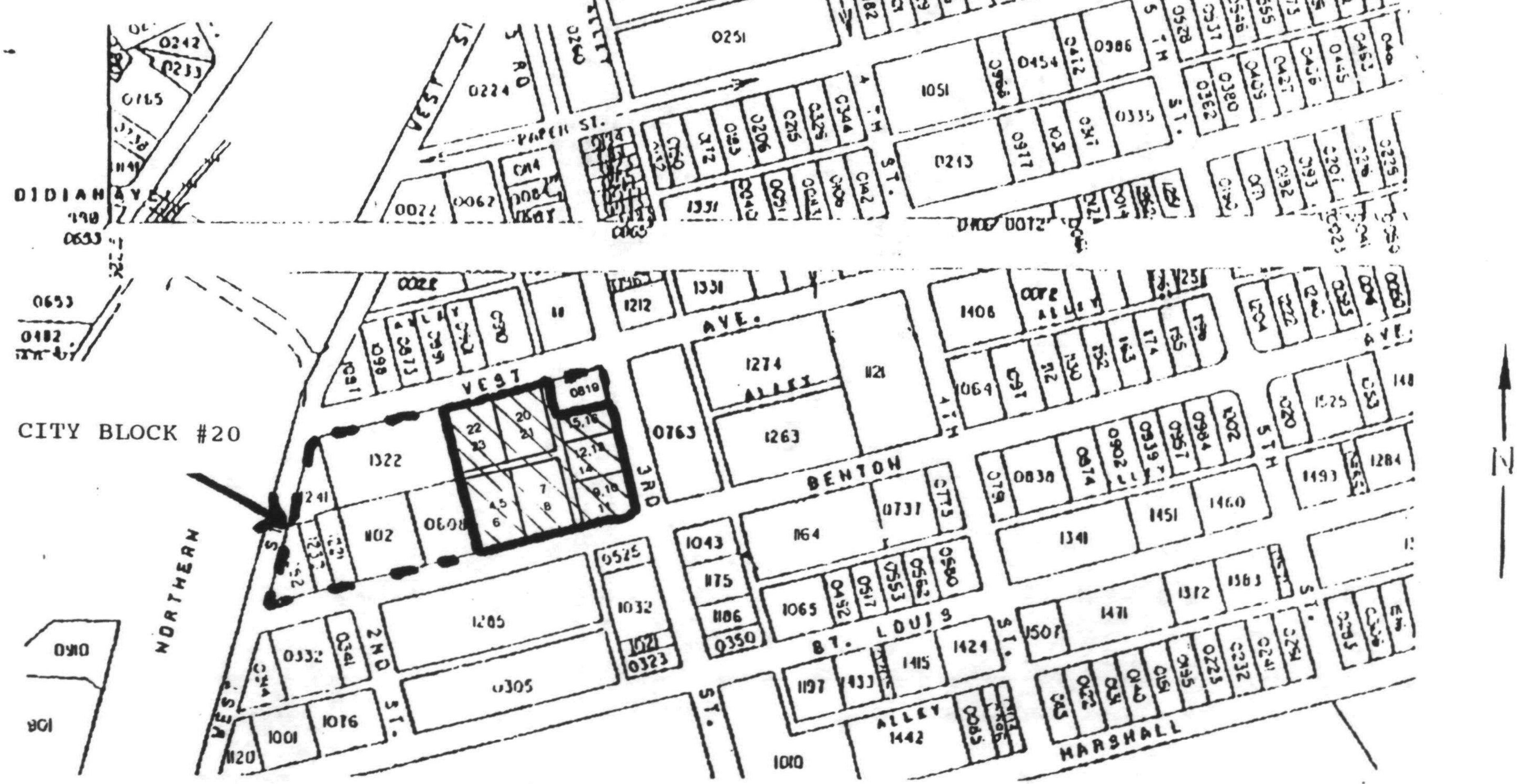
FIGURE 1
SCALE
1" 2000'
WAIN 07

FIGURE 2. SPECIFIC WOU LOCATION MAP

* LOT NUMBERS SHOWN OFF THE WOU ARE REAL ESTATE LOCATOR NUMBERS AND NOT OFFICIAL CITY LOT NUMBERS.

** TWO DIGIT LOT NUMBERS SHOWN ON THE WOU ARE OFFICIAL CITY LOT NUMBERS.

*** THE AREA MARKED WITH CROSS-HATCH IS THE WOU



From 1980 to 1987 the Wainwright property was leased to Imperial Ornamental Metals, who produced ornamental structural metal fabrications. The L.E. Mueller Company is the current tenant of the facility. The L.E. Mueller Company operates a emergency fire vehicle repair and remodeling shop at the Wainwright property.

2.2 Site Investigations

Beginning in July 1982, MDNR detected volatile organic compounds (VOCs) in samples collected from three Valley Park municipal wells. The VOCs included TCE, PCE and 1,1,1-trichloroethane (TCA). Sample results are included in Table 1. Concentrations of contaminants exceeded the State and Federal drinking water Maximum Contaminant Levels (MCLs). Figure 3 presents the locations of the three Valley Park municipal wells, along with two downgradient municipal wells owned by the City of Kirkwood.

The City of Valley Park began treating its public drinking water supply with an aerator after contamination was discovered in 1982. Treatment was later upgraded to an air stripper tower which succeeded in reducing contamination below acceptable limits. The City of Valley Park was connected to the St. Louis County water supply in 1988. The St. Louis County Water supply to the Valley Park area is derived from intakes on the Missouri River.

In June 1983, EPA conducted a partial NPDES compliance monitoring inspection at the Spencer-Kellogg facility (owned by Reichhold Chemical, Inc.) in downtown Valley Park. Analytical results of the non-contact cooling water revealed the presence of chlorinated VOCs. The investigation concluded that the VOC contamination detected in the cooling water was from the well at the facility which withdrew water from the same aquifer as the municipal wells.

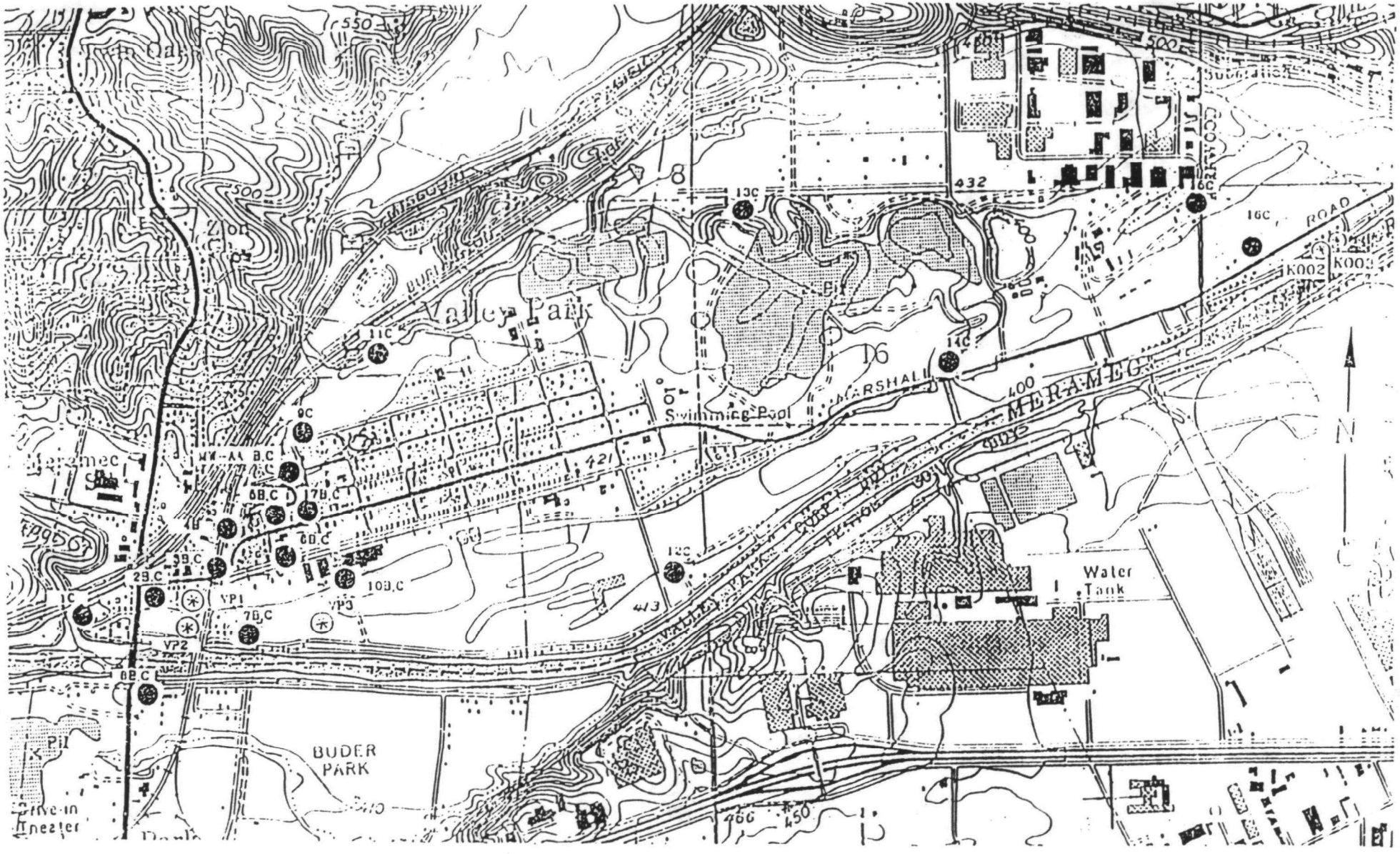
In April 1986, Wainwright was identified in a study conducted by contractors for EPA as the most likely potentially responsible party (PRP).

In August 1986, MDNR was notified that Valley Park city workers had encountered strong solvent odors during an excavation of a water line on the Wainwright property. With assistance from the City of Valley Park, MDNR collected and analyzed two shallow soil samples collected near the sewer line manhole from the north-south alley behind the Wainwright buildings. The analytical results revealed the presence of chlorinated hydrocarbons, similar to those found impacting the City of Valley Park municipal water supply wells.

TABLE 1
CONTAMINATION DATA FOR VALLEY PARK MUNICIPAL WELLS (7-12-82 - 7-23-87)
Source: PRC Engineering, 1986
ESE Limited RI, 1988

Date	Well #1			Well #2			Well #3		
	Trichloro-ethylene (ug/l)	Tetrachloro-ethylene (ug/l)	1,1,1-Trichloro-ethane (ug/l)	Trichloro-ethylene (ug/l)	Tetrachloro-ethylene (ug/l)	1,1,1-Trichloro-ethane (ug/l)	Trichloro-ethylene (ug/l)	Tetrachloro-ethylene (ug/l)	1,1,1 Trichloro ethane (ug/l)
July 12, 1982	--	--	--	--	--	--	95	1.5	33
April 6, 1983*	--	--		67	3.3	38	56	3.0	31
	--	--	--	63	3.5	37	69	3.5	38
April 14, 1983*	75	10.0	49	--	--	--	--	--	--
	76	12.0	48	--	--	--	--	--	--
September 19, 1983*	310	222	58	420	21.0	280	20	3.6	12
	280	130	60	370	18.0	26	370	16.0	190
October 12, 1983	290	120	130	190	16.0	120	280	78	180
November 9, 1983	310	94	180	180	16.0	120	--	--	
December 14, 1983	220	58	140	110	6.7	11.0	--	--	
February 3, 1984	330	200	140	--	--	--	200	12.0	120
June 26, 1984	--	--	--	--	--	--	180	11.0	120
October 24, 1984	63	18	62	--	--	--	93	9.2	120
January 29, 1985	62	78	25	--	--	--	140	9.1	75
June 18, 1985*	25	42	7.7	--	--	--	98	9.6	57
	30	44	10.0	--	--	--	90	9.9	56
July 10, 1985*	--	--	--	--	--	--	79	8.4	47
	--	--	--	--	--	--	83	8.1	44
September 16, 1985	41	63	16	--	--	--	113	11.2	67
October 28, 1985	46	33	19	--	--	--	56	5.2	32
March 17, 1986	26	21	9.1	--	--	--	79	6.9	46
July 23, 1987	21.1	140	4.25	--	--	--	337	225	236

*Morning and afternoon samples, respectively
-- denotes non-detect concentrations



LEGEND

CROSS SECTION (9-VP3) KIRKWOOD (K) PUMPING WELL
VALLEY PARK (VP) PUMPING WELL ⊛

CROSS SECTION (1-17) GROUNDWATER MONITORING WELL ●

CROSS SECTION (9-8)

VALLEY PARK MUNICIPAL WELLS & GROUNDWATER MONITORING WELLS VALLEY PARK-KIRKWOOD VICINITY VALLEY PARK, MISSOURI	FIGURE 3
	SCALE 1" = 1620'
	WAIN 07

Between May and September 1987, MDNR contracted with Hunter Engineering/ESE to perform a Limited Remedial Investigation (LRI). The study involved installation, sampling and analysis of 26 monitoring wells and sampling and analysis of the Meramec River. Analytical results from this investigation are presented in Table 2.

The LRI led to the following conclusions:

- PCE, TCE, and TCA concentrations were found in the Valley Park ground water at various monitoring wells, municipal wells, and an industrial well.

- The source of PCE and TCE contamination appeared to be in the vicinity of the Wainwright property. The highest concentrations of PCE and TCE were found in Monitoring Wells 17B, 17C, 10C, and the Reichhold well (refer to Figure 3 for well locations).

- The source of the TCA contamination is not the Wainwright property and appears to be located between Marshall Road and Valley Park municipal well #3. The highest concentrations of TCA were found in Valley Park well #3.

In April and October 1988, Wainwright contracted with an environmental firm to perform shallow composite soil sampling (from one to eight feet deep) behind the Wainwright building to the north. The analytical results indicated concentrations of PCE up to 2,200 ppm (parts per million) and TCE up to 540 ppm in the upper one foot of soil behind the building. Contaminant concentrations decreased with depth, but were detected down to eight feet.

2.3 Enforcement History

In 1985, the EPA evaluated the Valley Park TCE Site (Site) using CERCLA's Hazard Ranking System. The Site was evaluated based solely on ground water contamination. In 1986 the Site was placed on the National Priorities List (NPL) in Federal Register Volume 51, Number 111, Page 21091, Group 10.

On May 15, 1989, Wainwright was officially notified by EPA of their liability related to the Valley Park TCE Site under CERCLA Section 107.

In July and September 1989, Wainwright contractors collected samples from deeper (10 to 35 feet) soil borings under the building and to the south along Benton Street. Soil was field screened using a portable infrared spectrophotometer. Only soil indicating positive results during field screening was collected for laboratory analyses. Analytical results revealed

TABLE 2
ANALYTICAL RESULTS OF VALLEY PARK SAMPLING
(JULY 1987 - ESE)

PARAMETER:					CHLORIDE MG/L	DICHLORO-ETHYLENE UG/L	1,2-DICHLO-ROETHYLENE UG/L	CHLOROFORM UG/L	1,1,1-TCA UG/L	TETRA-CHLORIDE UG/L	TRICHLORO-ETHYLENE UG/L	TETRACHLORO ETHYLENE UG/L
UNITS: FLD. GRP.	#	SAMPLE ID	DATE	TIME								
VALPA2	31	MW01C0	07/24/87	08:45	92.4	2.17	<2.50	1.38	<2.00	1.96	<2.00	<2.50
VALPA2	41	MW02B0	07/28/87	09:00	138	<1.75	2.66	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	38	MW02C0	07/28/87	09:40	148	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	37	MW03B0	07/28/87	10:45	67.5	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	39	MW03C0	07/28/87	10:25	51.6	<1.75	<2.50	<1.00	<2.00	<1.25	15.9	5.48
VALPA2	44	MW04C0	07/28/87	11:40	59.6	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	43	MW05B0	07/28/87	13:45	119	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	22.4
VALPA2	45	MW05C0	07/28/87	13:15	40.7	<1.75	<2.50	<1.00	<2.00	<1.25	7.91	2.50
VALPA2	1	MW06B0	07/29/87	10:20	114	<1.75	2.74	<1.00	4.46	<1.25	28.0	66.4
VALPA2	7	MW06C0	07/29/87	09:50	59.6	2.47	4.62	<1.00	8.81	<1.25	50.5	63.8
VALPA2	18	MW07B0	07/27/87	15:35	36.2	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	2.50
VALPA2	14	MW07C0	07/27/87	15:00	95.3	4.24	8.46	3.25	21.0	<1.25	45.8	<2.50
VALPA2	15	MW07C0	07/27/87	15:00	09.4	3.02	12.0	<1.00	31.0	<1.25	69.7	8.6
VALPA2	25	MW08B0	07/27/87	08:45	58.6	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	2.50
VALPA2	26	MW08C0	07/27/87	09:30	43.7	<1.75	5.52	<1.00	<2.00	<1.25	2.64	<2.50
VALPA2	42	MW09C0	07/28/87	14:40	33.8	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	17	MW10B0	07/27/87	14:15	83.4	<1.75	4.70	<1.00	<2.00	<1.25	38.8	36.2
VALPA2	13	MW10C0	07/27/87	13:45	98.3	3.02	5.70	2.55	5.37	2.28	102	248
VALPA2	16	MW11C0	07/27/87	11;50	566	<1.75	3.32	<1.00	<2.00	<1.25	16.8	95.0
VALPA2	34	MW12C0	07/27/87	10:55	9.53	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	2.50
VALPA2	28	MW13C0	07/24/87	10:50	145	<1.75	<2.50	<1.00	<2.00	<1.25	3.60	4.82
VALPA2	29	MW13C0	07/24/87	10:55	140	<1.75	<2.50	<1.00	<2.00	<1.25	3.94	6.45
VALPA2	30	MW04C0	07/24/87	15:25	50.6	<1.75	<2.50	1.03	<2.00	1.58	<2.00	2.50
VALPA2	33	MW15C0	07/24/87	15:00	77.5	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	36	MW16C0	07/24/87	11:50	47.2	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	2.50
VALPA2	12	MW17B0	07/29/87	11:30	80.4	<1.75	113	<1.00	<2.00	<1.25	535	2007
VALPA2	11	MW17B0	07/29/87	11:30	78.5	<1.75	110	<1.00	<2.00	<1.25	646	3207
VALPA2	10	MW17C0	07/29/87	11:15	72.5	<1.75	47.4	<1.00	<2.00	<1.25	311	815
VALPA2	20	VP0100	07/23/87	11:20	59.6	<1.75	5.19	<1.00	4.25	<1.25	21.1	14.0
VALPA2	21	VP0300	07/23/87	11:35	49.4	13.1	15.4	<1.00	236	<1.25	337	22.5
VALPA2	27	KW0100	07/23/87	15:30	39.7	2.25	<2.50	<1.00	5.21	<1.25	5.72	<2.50
VALPA2	22	KW0200	07/23/87	15:55	45.2	2.46	<2.50	<1.00	6.76	1.40	<2.00	<2.50
VALPA2	19	CM0100	07/23/87	14:45	34.3	<1.75	5.93	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	23	RC0100	07/23/87	13:40	83.7	2.01	<150	<1.00	5.47	1.43	518	1977
VALPA2	24	AC0100	07/23/87	14:30	111	2.65	<2.50	1.70	4.45	2.78	25.5	33.9
VALPA2	32	BB0100	07/27/87	09:15	<2.00	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	35	MR0100	07/27/87	10:00	8.44	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA2	40	HP0100	07/29/87	08:30	<2.00	<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA1	10	SC0100	06/25/87	14:43		<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA1	3	DW0100	06/25/87	15:30		<1.75	<2.50	7.40	<2.00	<1.25	<2.00	<2.50
VALPA1	2	AD0100	06/25/87	15:00		<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50
VALPA1	4	AD0200	07/09/87	07:40		<1.75	<2.50	<1.00	<2.00	<1.25	<2.00	<2.50

Notes:
MW = Monitoring Wells
VP = Valley Park Wells
DW = Drilling Water
KW = Kirkwood Wells
CM = Cromer Wells
AD = Auger Decon
RC = Reichhold Chemical
AC = Absorbent Cotton
BB = Bailer Blank
MR = Meramec River
HP = Hand Pump Blank
SC = Steam Cleaner

contamination under the building concentrated near the northwest annex and to the north of the building.

An Administrative Order on Consent between EPA and Wainwright was signed on August 7, 1990 which provided for a removal action at the WOU. On August 13, 1990, MDNR and EPA approved Wainwright's Revised Removal Work Plan. The plan outlined a cleanup action that included the excavation of soil in areas which had previously been identified as having TCE or PCE contamination over 20 ppm.

The removal action was performed between September and November, 1990. Approximately 330 cubic yards of contaminated soil was excavated and disposed of at an hazardous waste landfill. Verification sampling in the excavation revealed TCE and PCE contamination remaining above the established cleanup level of 20 ppm. The removal action was discontinued at that time due to the greater than anticipated magnitude of contamination. The excavated area was subsequently backfilled with pea gravel and asphalted to minimize the infiltration of water into the contaminated area.

On May 22, 1991 Wainwright and MDNR signed an Administrative Order on Consent to conduct the Remedial Investigation and Feasibility Study (RI/FS) at the WOU, which would thoroughly characterize the extent and magnitude of contamination. The objectives of the RI/FS at the WOU was to (1) characterize the nature and extent of the soil contamination at the WOU, (2) determine whether ground water under the WOU is contaminated and identify the connection between ground water contamination and contaminated soils, (3) characterize the geology and ground water flow patterns at the WOU, (4) identify risks from contamination at the WOU, and (5) develop alternatives for the cleanup of contaminants at the WOU. The Results of the RI and FS activities are summarized in Sections 5.0 and 7.0, respectively. Copies of the RI and FS reports are included in the Administrative Record.

In 1989, 1991 and 1993, EPA sent Section 104(e) Requests to a number of industries located in Valley Park, Missouri. The responses indicated there were no other PRPs for the WOU.

SECTION 3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI/FS and the Proposed Plan for the WOU were released to the public on August 14, 1994. The Administrative Record file, which included the RI/FS reports and the Proposed Plan, was made available for public review at the information repositories maintained at the Valley Park Public Library and at MDNR Hazardous Waste Program in Jefferson City, Missouri. The notice of availability for these documents was published in the West

County Suburban Journal, on August 14, 1994. The public comment period on these documents continued for thirty days from August 14 to September 12, 1994.

A public meeting was held by MDNR and EPA on August 24, 1994 in the Valley Park City Hall in Valley Park, Missouri. Interested citizens were given the opportunity to hear a summary of MDNR's Proposed Plan and provide comments or ask questions concerning the investigations or remedial alternatives. A transcript of the public meeting is included in the Administrative Record. A response to the comments received during the public comment period is included in the Responsiveness Summary section of this Record of Decision. At this meeting, MDNR and EPA representatives answered questions about problems at the WOU and the remedial process. In summary, the public participation requirements as defined in CERCLA Sections 113(k)(2)(B)(i-v) and 117 were satisfied.

This decision document presents the selected remedial action for the Wainwright Operable Unit of the Valley Park TCE Site, in Valley Park, Missouri, chosen in accordance with the provisions of CERCLA, as amended by SARA, and the National Contingency Plan (NCP). The selection of a response action for the WOU is based on the Administrative Record.

SECTION 4.0 SCOPE AND ROLE OF RESPONSE ACTION

This Record of Decision selects an interim action to address contamination at the WOU which acts as a source for ground water contamination for the Valley Park TCE Site. This Record of Decision addresses all contaminants identified at the WOU in each media, including ground water and soils. Contaminated ground water located off the WOU will be addressed in future actions for the larger Valley Park TCE Site. The interim action selected in this Record of Decision will be consistent with any planned future actions for the Valley Park TCE Site, to the extent possible.

The Remedial Investigation performed by Wainwright clearly identified three principle threats at the WOU: the contaminated ground water originating on the Wainwright property, the contaminated subsurface soils acting as a source of ground water contamination, and contaminated surface soils. The remedial action objective for the WOU is to eliminate the current and to prevent future unacceptable exposures due to these three principal threats.

SECTION 5.0 SUMMARY OF WOU CHARACTERISTICS

Work plans for the WOU RI/FS were approved on February 4, 1992 by MDNR. Field activities related to the RI/FS were conducted from April through September 1992.

Listed below is a summary of the findings of the RI:

- The soils in the Valley Park area are alluvial in nature and act as the primary shallow aquifer. There are three basic soil horizons underlying the WOU. The upper soil zone is silty clay which ranges from 5 to 40 feet thick. The middle zone is composed of lenses of sand and gravel, which range from 8 to 46 feet thick. The basal zone is limestone bedrock.

- The water table was most recently encountered at depths between 19.8 and 21.48 below ground level. The ground water does not appear to be perched. Ground water flow is toward the Meramec River to the south, except possibly during flooding, which can change ground water elevations and reverse gradients. Ground water flow rates in the alluvium are estimated at 763 feet per year.

- PCE and TCE are the primary contaminants of concern at the WOU. Various semi-volatile compounds and metals were also identified in WOU soils as being elevated. Elevated metals concentrations were also detected in ground water upgradient of the WOU. The metals detected in the ground water may be due to suspended solids present in the upgradient wells.

- The greatest concentrations of PCE and TCE in the ground water (1500 parts per billion (ppb) and 420 ppb, respectively) occurred in wells closest to and immediately downgradient of the WOU. No wells were drilled directly under the WOU. Upgradient wells contained either no contamination or very low concentrations.

- Soil contamination concentrations show a general reduction with depth, but extend to depths greater than 35 feet. Two neighboring residential yards to the east and possibly industrial areas to the west have been contaminated by activities on the Wainwright. Areas off the WOU to the north and south did not have contaminated soil. The highest contamination in the soil was found on the Wainwright property at 6800 ppm for PCE and 420 ppm for TCE. The only known source of contamination at the WOU is Wainwright Industries, Inc. as a result of its operation at the WOU from 1947 to 1979.

-A risk assessment conducted by the Missouri Department of Health was included in the RI/FS. A more detailed summary

of WOU risks and the potential routes of exposure will be presented in Section 6.0.

-The remedial alternatives contained in the FS will be summarized in Section 7.0.

After completion of the RI/FS field activities, the occurrence of the two following events affected the WOU characterization:

1) Valley Park was flooded during September of 1993. MDNR conducted post flood soil sampling along the fence-line separating the Wainwright property from neighboring residential properties. PCE was detected as high as 11 ppm in the surface soils of the Cotton residence located at 318 3rd Street.

2) The Cotton residents also began complaining of strong odors in the house after the flood. Air sampling conducted in January 1994 by EPA contractors revealed the presence of PCE (2400 micrograms per cubic meter (ug/m^3)) along with other VOCs in the Cotton home. Traps were installed on plumbing fixtures in the house and air sampling was conducted again in March 1994. Organic contaminants associated with the WOU were found at much lower levels during the March sampling with PCE detected at 140 ug/m^3.

SECTION 6.0 SUMMARY OF RISKS

As part of the RI/FS process, the Missouri Department of Health (MDOH), on behalf of MDNR, developed a Baseline Risk Assessment (BRA) to estimate the human health and environmental risks associated with possible exposure to contaminants identified at the WOU. The BRA was conducted in accordance with all relevant and current EPA risk assessment guidance. First, contaminants of concern were identified. Then, the potential toxicities of these contaminants were reviewed, potential exposures were described and quantified, and risk characterization was performed. This analysis provided valuable information used to determine the need for remedial action(s).

The contaminants of concern (COCs) include all VOCs and semi-volatile organic compounds (specifically, polynuclear aromatic hydrocarbons or PAHs) detected in the ground water and the soil. Notably, PCE and TCE of the VOC group and Benzo(a)pyrene of the PAHs were identified as several of the COCs. The metals detected in the ground water and the soil were evaluated on an individual basis and retained if present above background concentrations. Notably, barium, chromium, lead, manganese and zinc were identified as several of the metal COCs. Several of the COCs are viewed by the EPA to be "possible" or "probable" human

carcinogens and several of the COCs are known to have adverse non-carcinogenic health effects. Consequently, both non-carcinogenic health hazards and carcinogenic risks due to exposure to these compounds were evaluated.

The potential for non-carcinogenic health risk is evaluated by comparing estimated contaminant intake to a reference dose. The ratio of contaminant intake to the reference dose is referred to as the hazard quotient or hazard index. A hazard quotient greater than one indicates that a hazard may be likely to exist. Since the estimated contaminant intakes calculated in the BRA represent conservatively high estimates, the calculated hazard quotients represent conservatively high risks.

The potential for carcinogenic risk is estimated by multiplying estimated contaminant intake by an established slope factor for each contaminant. The resulting figure represents the chance that a receptor would develop cancer in excess of a background incidence. For example, an excess risk of one in ten thousand (represented as 1×10^{-4}) indicates that one additional person may contract cancer out of 10,000 people identically exposed to a contaminant. A cancer risk greater than one in ten thousand (1×10^{-4}) is considered unacceptable and requires remedial action. A cancer risk less than one in one million (1×10^{-6}) is considered acceptable. The cancer risk range between 1×10^{-6} and 1×10^{-4} is considered acceptable unless specific conditions warrant otherwise. The calculated carcinogenic risks are viewed as conservatively high due to the EPA's carcinogenic risk assessment methodology.

The exposure assessment was accomplished through the identification of exposure pathways, development of Reasonable Maximum Exposure (RME) scenarios, and the calculation of contaminant intake values. Several potential exposure pathways were investigated: ingestion of and dermal contact with contaminated soil and ground water, and inhalation of air impacted with contaminants volatizing from the ground water and soil. A total of six RMEs were developed for the WOU:

- RME 1 - An adult on-site worker exposed to the WOU 250 days per year for 25 years;
- RME 2 - An adolescent visiting the WOU twice a week, 39 weeks per year for six years;
- RME 3 - An adult off-site resident exposed to the WOU 365 days per year for 30 years;
- RME 4 - A child off-site resident exposed to the WOU 365 days per year for seven years;

- RME 5 - An adult living on the WOU 365 days per year for 30 years; and,

- RME 6 - A child living on the WOU 365 days per year for seven years.

Tables 3 and 4 summarize the non-carcinogenic health hazards and carcinogenic risks developed for the WOU, respectively. The non-carcinogenic total hazard indices exceed 1.0 for RMEs 3, 4, 5 and 6. Individual pathway hazard indices exceeded 1.0 for ingestion and dermal contact with ground water, and inhalation of air emissions from ground water while showering. The carcinogenic risks exceeded 1×10^{-4} for RMEs 1, 3, 4, 5 and 6. Individual pathway cancer risks exceeded 1×10^{-4} for ingestion of ground water, ingestion and dermal contact of soil, and inhalation of air emissions from ground water while showering.

The calculated potential risks are based, in part, on ingestion, inhalation and dermal contact of contaminants in ground water. However, exposures to contaminated ground water at the WOU are not currently occurring.

A formal environmental risk characterization was not performed as part of the BRA. However, exposures to the environment were not identified by MDNR and EPA based on the location of the WOU in downtown Valley Park and the location of the contamination in ground water and subsurface soils. Under current conditions, no adverse impacts were identified for the local flora and fauna ecosystems.

Actual or threatened release of hazardous substances from this WOU, if not addressed by the remedial action presented in this ROD, may present a current or potential unacceptable threat to public health, welfare, or the environment. Residents and/or employees of properties on the WOU are potentially exposed to the health risks posed by the actual or threatened release of hazardous substances in the soil, air and ground water through dermal, ingestion and inhalation exposures. State and Federal Applicable or Relevant and Appropriate Requirements (ARARs) will be used to define cleanup goals for ground water, as appropriate. Cleanup goals for contaminated soils will be developed based on the threats to contaminating ground water and from direct contact.

TABLE 3. SUMMARY OF NONCARCINOGENIC RISKS

Pathway Hazard Indices							
	Groundwater		Soil		Air		
RME	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Inhalation (while showering)	Inhalation (soil offgassing)	Total Hazard Index
RME 1	NC	NC	0.15	0.49	NC	0.0014	0.64
RME 2	NC	NC	0.029	0.09	NC	0.00071	0.12
RME 3	NC	NC	0.42	0.73	NC	0.002	1.2
RME 4	NC	NC	0.76	0.79	NC	0.0095	1.6
RME 5	51	4.0	0.42	0.73	1.1	0.002	57
RME 6	12	0.64	0.76	0.79	0.59	0.0095	15

NC = Not Calculated

TABLE 4. SUMMARY OF CARCINOGENIC RISKS

Pathway Cancer Risks							
	Groundwater		Soil		Air		
RME	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Inhalation (while showering)	Inhalation (soil offgassing)	Total Cancer Risk
RME 1	NC	NC	2.5×10^{-5}	6.2×10^{-5}	NC	3.1×10^{-5}	1.2×10^{-4}
RME 2	NC	NC	6.1×10^{-6}	6.9×10^{-6}	NC	1.9×10^{-7}	1.3×10^{-5}
RME 3	NC	NC	8.7×10^{-5}	1.1×10^{-4}	NC	2.7×10^{-6}	2.0×10^{-4}
RME 4	NC	NC	1.9×10^{-4}	7.0×10^{-5}	NC	3.0×10^{-6}	2.6×10^{-4}
RME 5	5.3×10^{-4}	5.7×10^{-5}	8.7×10^{-5}	1.1×10^{-4}	7.7×10^{-4}	2.7×10^{-6}	1.6×10^{-3}
RME 6	2.9×10^{-4}	2.5×10^{-5}	1.9×10^{-4}	7.0×10^{-5}	3.7×10^{-5}	3.0×10^{-6}	6.2×10^{-4}

NC = Not Calculated

SECTION 7.0 DESCRIPTION OF ALTERNATIVES

Description of Alternatives

Ten alternatives analyzed in detail are presented below and summarized in Table 5. These alternatives were presented in the Proposed Plan. Alternatives one through nine were developed by Wainwright Industries in the Feasibility Study Report. The MDNR and EPA developed Alternative 10 which is simply a modification of Alternative 3 and was discussed in the Proposed Plan. All costs are estimated. Time-frames to achieve Applicable or Relevant and Appropriate Requirements (ARARs) and Performance Standards (PSs), defined later in this section in the ARARs and PSs subsections (Pages 25 to 29) for the contaminated ground water and soils, are only estimated at this time due to the fact that the scope of the RI/FS effort did not include full vertical and horizontal characterization of the contamination and the alluvial aquifer. Complete characterization will be completed and a time-frame to achieve ARARs and PSs for the soil and ground water remediation activities will be estimated during the design phase of the remedial action. For this reason, concentration reductions and risk reduction to be achieved can not be estimated. For general information, time-frames to achieve ARARs and PSs using similar cleanup technologies at similar sites will be given based upon MDNR and EPA experience.

Common Elements for Alternatives 3 through 10 (Common Elements)

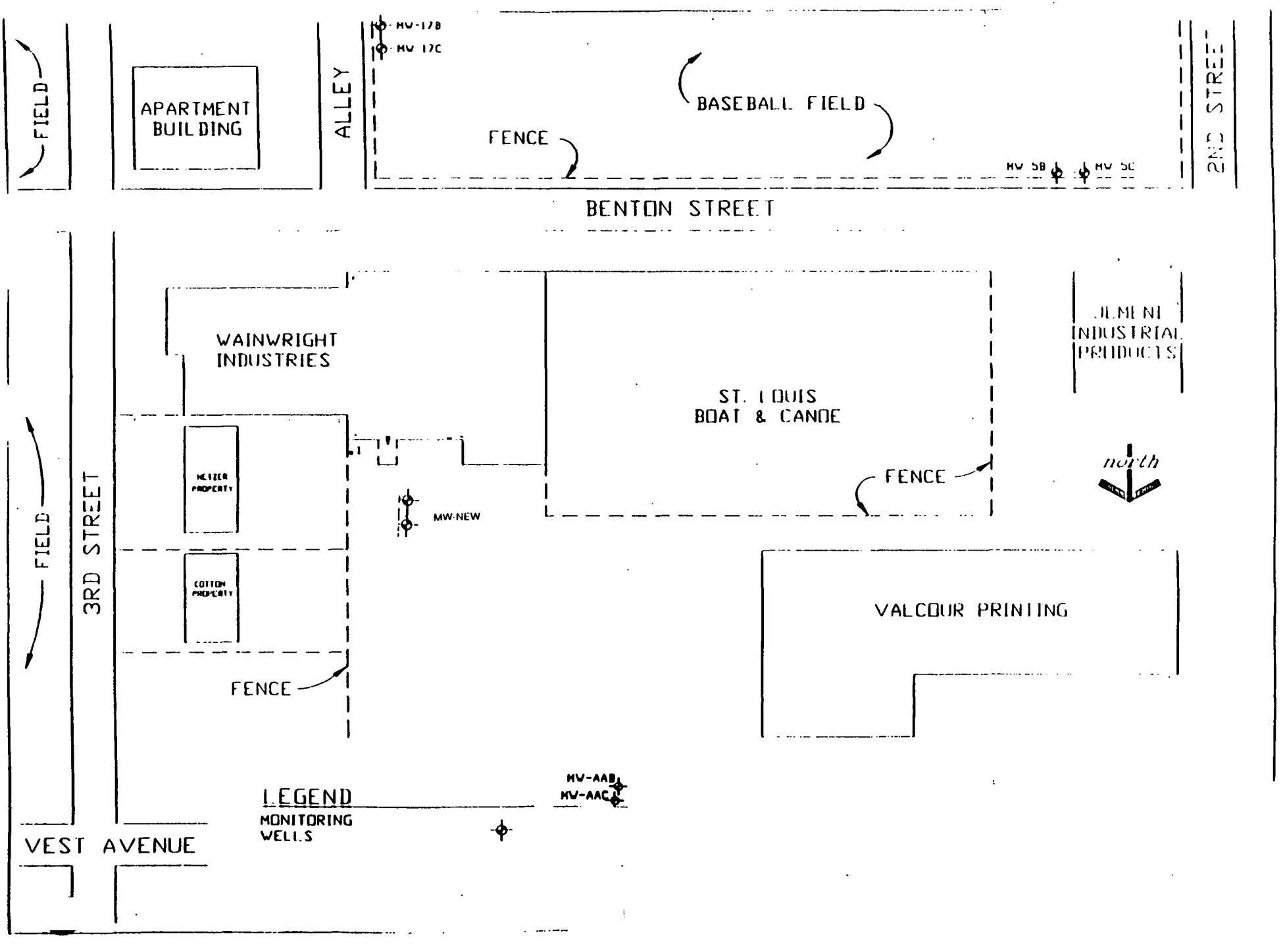
A deed restriction would be placed on the WOU properties by the respective owners prohibiting the installation and operation of ground water supply wells as long as the ground water and soils are contaminated above ARARS and PSs.

A ground water monitoring program would be implemented using existing and new monitoring wells. Data from the ground water monitoring program would be used to evaluate the effectiveness of the remedial action taken under each alternative and to monitor changes in ground water quality. For cost estimating purposes, the program was assumed to include existing upgadient wells (MW-AAB and MW-AAC), downgradient wells (MW-5 and MW-17), and a new set of two wells installed directly north of the current Wainwright building (see Figure 4). One of the two new wells will be finished and screened at the top of the bedrock. The second new well would be screened in the water table above the bedrock well. Quarterly sampling for the first year and semi-annual sampling thereafter, and Volatile Organic Compound chemical analyses were also assumed to take place.

TABLE 5. SUMMARY OF REMEDIAL ALTERNATIVES

General Response Action	Technology Type/Process Options	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6	ALT 7	ALT 8	ALT 9	ALT 10
No Action	No Action	✓									
Institutional Actions	Groundwater Deed Restriction		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Groundwater Monitoring		✓	✓	✓	✓	✓	✓	✓	✓	✓
Removal Action	Soil Excavation			✓							✓
Isolation/Containment Action	Commercial Landfill Disposal			✓							✓
Collection Action	Groundwater Extraction			✓	✓		✓		✓	✓	✓
Soil Treatment Action	Soil Vapor Extraction			✓	✓	✓	✓	✓	✓	✓	✓
Groundwater Treatment Actions	Air Sparging			✓	✓	✓			✓		✓
	Air Stripping			✓	✓		✓		✓	✓	✓
Treated Groundwater Disposition Actions	POTW			✓	✓		✓				✓
	Aquifer Re-injection								✓	✓	

FIGURE 4. PROPOSED WOU GROUND WATER MONITORING WELLS



Alternative 1

Present Worth Cost: $ 0
This is the no action alternative required for evaluation by the National Contingency Plan. No actions would be taken to reduce the potential for exposure of humans to WOU contaminants. The restoration of soil and ground water would be accomplished through natural attenuation processes. Through natural attenuation, ground water contaminants would be transported off the WOU through the alluvial aquifer toward the Meramec River. MDNR and EPA experience would indicate that this alternative would take in excess of 50 years to restore soil and ground water to ARARs and PSs on the WOU. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 2

Present Worth Cost: $ 785,354
This is a limited action alternative which reduces the potential exposure to contaminants through implementing a deed restriction which prohibits the installation and use of a ground water supply well on the WOU. Alternative 2 also includes a ground water monitoring program different than the one described for the common elements in that sampling from only existing wells MW-AAB, MW-AAC, MW-5 and MW-17 on a quarterly frequency will be required. The restoration of impacted soil and ground water would be accomplished through natural attenuation processes. Through natural attenuation, ground water contaminants would be transported off the WOU through the alluvial aquifer toward the Meramec River. MDNR and EPA experience would indicate that this alternative would take in excess of 50 years to restore soil and ground water to ARARs and PSs on the WOU. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 3

Present Worth Cost: $ 4,029,880
This is an active soil and ground water restoration alternative which consists of the common elements, excavation and treatment/disposal off the WOU of shallow contaminated soil on the WOU, extraction and treatment of WOU contaminated ground water with discharge to the Publicly Owned Treatment Works (POTW), soil vapor extraction of WOU contaminated subsurface soils, and air sparging to accelerate the ground water cleanup. Detailed characterization of the aquifer and vadose zone would be required during the design phase.

Surface and near-surface soils from the north side of the Wainwright building would be excavated to reduce zones containing high VOC concentrations. This will be a new excavation activity

which is in addition to the original removal excavation activity conducted in 1990. For cost estimating purposes, it was assumed soils exceeding 1000 ppm PCE in the upper five feet of soil would require excavation. These assumptions produced an estimate of 350 cubic yards of excavated soils. Clay would be backfilled into the excavated areas. The excavated soils would be transported to an MDNR and EPA approved off-site treatment and disposal facility.

The technology identified for soil treatment at the off-site hazardous waste treatment facility is low-temperature thermal desorption. This technology is assumed mainly for cost estimating purposes. The final treatment technology selected for the excavated soil may change depending on the facility selected and subject to MDNR and EPA approval.

The remaining subsurface contaminated soils located above the ground water table would be remediated using soil vapor extraction (SVE). This system would consist of a series of extraction and inlet wells installed within the vadose zone (unsaturated soils above the ground water table) north of and beneath the Wainwright building. A vacuum would be applied to the extraction wells, thereby creating an air flow through the vadose zone. As air moves through the soils, contaminants would be transferred from the adsorbed phase to the vapor phase.

Air emissions from the SVE system would comply with regulations of the St. Louis County Department of Community Health & Medical Care, Air Pollution Control Agency, MDNR and EPA. Air withdrawn from the subsurface would be discharged via a properly designed stack that would insure acceptable ambient air concentrations of contaminants both on and off the WOU. For cost estimating purposes, it was assumed that emission control devices would not be required.

Contaminated WOU ground water would be hydraulically controlled and collected through the entire vertical section of the aquifer on the WOU. For cost estimating purposes, it was estimated that one extraction well pumping 175 gallons per minute (GPM) would hydraulically control the WOU ground water. Extracted ground water would be treated on the WOU using an air stripper system. The air stripper would remove the VOCs from the ground water and transfer them to the vapor phase. Air emissions from the air stripper would be managed in the same manner as the SVE emissions. The treated ground water would then be discharged into the POTW system, operated by the St. Louis Metropolitan Sewer District (MSD) for treatment and ultimate disposal into the Meramec River.

In addition to the SVE and ground water extraction (GWE) systems, a ground water air sparging system would be installed in the area directly north of and beneath the Wainwright building.

Compressed air would be injected into the aquifer through sparging wells. VOCs adsorbed to the soils below the ground water table and dissolved in the ground water would be transferred to the vapor phase and transported to the vadose zone. The SVE system would remove the VOCs from the vadose zone.

It is important to note that the technical feasibility of operating a ground water sparging system is dependent upon the seasonal depth to ground water and the design of the SVE system. Effective design of the SVE system would prevent potential contaminant confinement and lateral dispersion induced by the overlying silt/clay unit. However, it is possible that risks associated with air sparging (i.e., ground water mounding and uncontrolled soil gas emissions) could outweigh the potential benefits. The remedial design would analyze this issue and obtain the necessary information using a pilot study and/or additional field work. Air sparging would be eliminated from the remedial action if the risks are determined to be unacceptable.

The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site. The active remediation of the WOU soils and ground water would significantly reduce the cleanup timeframe as compared to Alternatives 1 and 2.

Alternative 4

Present Worth Cost: $ 3,685,162
Alternative 4 is an active remediation alternative identical to Alternative 3 except that soil excavation and treatment/disposal off the WOU would not occur.

The active remediation of the WOU soils and ground water would significantly reduce the cleanup timeframe as compared to Alternatives 1 and 2. The cleanup time-frames for Alternatives 3 and 4 would be comparable. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 5

Present Worth Cost: $ 1,469,513
Alternative 5 is an active remediation alternative which includes the common elements, SVE and air sparging. Alternative 5 is identical to Alternative 3 except that soil excavation and treatment/disposal off the WOU and ground water extraction would not occur.

The active remediation of the WOU ground water and soils would reduce the cleanup timeframe as compared to Alternatives 1 and 2. The cleanup timeframe for Alternative 5 would be slower than Alternatives 3 and 4 due to the absence of the ground water

extraction system. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 6

Present Worth Cost: $ 3,583,356
Alternative 6 is an active remediation alternative which includes the common elements, SVE and ground water extraction and treatment. Alternative 6 is identical to Alternative 3 except that soil excavation and treatment/disposal and air sparging would not occur.

The active remediation of the WOU ground water and soils would reduce the cleanup timeframe as compared to Alternatives 1 and 2. The cleanup timeframe for Alternative 6 could be slower than Alternatives 3 and 4 due to the absence of the air sparging system. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 7

Present Worth Cost: $ 1,370,715
Alternative 7 is an active remediation alternative which includes the common elements and SVE. Alternative 7 is identical to Alternative 5 except that air sparging would not occur.

The active remediation of the WOU soils would reduce the soils cleanup timeframe as compared to Alternatives 1 and 2. Through natural attenuation, ground water contaminants on and off the WOU would be transported through the alluvial aquifer toward the Meramec River. MDNR and EPA experience would indicate that this alternative would take in excess of 50 years to achieve ground water ARARs. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 8

Present Worth Cost: $ 2,168,010
Alternative 8 is an active remediation alternative which includes the common elements, ground water extraction and treatment, SVE and air sparging. Alternative 8 is identical to Alternative 4 except that treated ground water would be reinjected into the aquifer underneath the WOU rather than discharged into the POTW.

The air stripper effluent would be sampled for parameters consistent with the regulations of the Underground Injection Control (UIC) Program, managed jointly by the MDNR - Division of Geology and Land Survey (DGLS) and the MDNR - Division of Environmental Quality. Reinjection is a complicated issue

because it could either accelerate ground water remediation or alter the direction of the WOU ground water which would prevent the ground extraction system from achieving hydraulic control of the contaminated ground water.

The active remediation of the WOU soils and ground water would significantly reduce the cleanup timeframe relative to Alternatives 1 and 2. The cleanup time-frames for Alternatives 3, 4 and 8 would be comparable. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 9

Present Worth Cost: $ 2,068,186
Alternative 9 is an active remediation which includes the common elements, ground water extraction and treatment, and SVE. Alternative 9 is identical to alternative 6 except that treated ground water would be reinjected into the aquifer underneath the WOU rather than discharged into the POTW.

The air stripper effluent would be sampled for parameters consistent with the regulations of the Underground Injection Control (UIC) Program, managed jointly by the MDNR - Division of Geology and Land Survey (DGLS) and the MDNR - Division of Environmental Quality. Reinjection is a complicated issue because it could either accelerate ground water remediation or alter the direction of the WOU ground water which would prevent the ground extraction system from achieving hydraulic control of the contaminated ground water.

The active remediation of the WOU ground water and soils would reduce the cleanup timeframe relative to Alternatives 1 and 2. The cleanup timeframe for Alternative 9 could be slower than Alternatives 3, 4, and 8 due to the absence of the air sparging system. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Alternative 10

Present Worth Cost: $3,992,649
Alternative 10 is an active remediation which includes the common elements, ground water extraction and treatment, SVE, air sparging and soil excavation/treatment/disposal. This will be a new excavation activity which is in addition to the original removal excavation activity conducted in 1990. Alternative 10 is a modification of Alternative 3. The modifications focus on the risk associated with surface soils, the potential for contamination to travel along the sewer trench traversing the WOU, and a contingency for remedial actions related to contamination of ambient air at properties within the WOU.

Chemical analyses of shallow soil samples, taken from the 6"-12" interval below surface grade documented elevated levels of VOCs on the Wainwright property, and elevated levels of VOCs and PAHs adjacent to the fence between the Wainwright property and the Cotton and Netzer properties. During the remedial design for this alternative, surface soil samples, to be taken from the 0"-6" interval below surface grade, would be obtained from the Wainwright, Netzer, Cotton and St. Louis Boat and Canoe properties and analyzed for PAHs and VOCs. Based on these sampling results, surface soils with VOC and/or PAH levels exceeding the direct contact soil performance standards, defined later in this section in the ARARs and PSs subsections on Pages 25 to 29, would be addressed in the following manner:

1. VOC-contaminated surface soils located on the Wainwright property would be covered to prevent contact without excavation occurring. At least a four inch layer of gravel was assumed for cost estimating purposes. An uncontaminated soil cover could be used instead of gravel if mixing of the uncontaminated soil with contaminated soils would not complicate the remedial action. The contaminated surface soils must achieve the direct contact performance standards within five years from startup of the SVE system. If performance standards are not achieved within five years, a one foot depth of the original contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. The excavation would be backfilled to the original grade and revegetated consistent with the existing property;

2. PAH contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. All PAH contaminated surface soils would be excavated until direct exposure performance standards could be met. For cost estimating purposes, it was assumed a one foot deep excavation would be required. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property; and,

3. VOC and PAH contaminated surface soils located on the WOU but off the Wainwright property would be excavated to one foot below surface and taken to a treatment facility off the WOU. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property.

For cost estimating purposes, it was estimated that 95 cubic yards of soil would require excavation and treatment. The technology identified for soil treatment at the hazardous waste

treatment facility off the WOU is low-temperature thermal desorption. This technology is assumed for cost estimating purposes. The final treatment technology selected for the excavated soil may change depending on the facility selected and subject to MDNR and EPA approval.

During the remedial design, the sewer trench soils would be characterized to ascertain the concentration and horizontal extent of contamination. This information would be used in designing the SVE system.

In addition, ambient air samples from the interior of buildings on the WOU will be analyzed for WOU contaminants during the remedial design. MDOH health-based ambient air criteria will be used to determine the need for remedial actions to prevent unacceptable exposure risks. Remedial action costs for ambient air risks were generally estimated in the contingency costs and were not technology specific.

The active remediation of the WOU soils and ground water in Alternative 10 would significantly reduce the cleanup timeframe relative to Alternatives 1 and 2. The cleanup time-frames for Alternatives 3, 4, 8 and 10 would be comparable if air sparging is approved in the remedial design. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site.

Applicable or Relevant and Appropriate Regulations (ARARs)

Section 121(d)(2) of CERCLA requires that remedial actions conducted achieve ARARs. ARARs are legally enforceable Federal or State substantive environmental standards, requirements, criteria or limitations. ARARs are divided into three types: contaminant-specific, location-specific and action-specific. A CERCLA remedial action is required to meet the substantive requirements of ARARs for activities conducted on-site; both substantive and administrative requirements are required when activities occur off-site. The following listing includes both State of Missouri and Federal ARARs. When both State and Federal ARARs address the same issue, the more stringent ARAR would apply. In addition, there are other applicable non-environmental laws that must be followed which are in a separate section entitled "Applicable Non-Environmental Laws."

Contaminant-Specific

1) The Federal Safe Drinking Water Act (SDWA) non-zero Maximum Contaminant Level Goals (MCLGs) and Maximum Contaminant Levels (MCLs), 40 CFR § 141.50 - 141.51 and 40 CFR § 141.11 - 141.16, apply to the ground water underneath the WOU only. Also, the Missouri Water

Quality Standards for drinking water supplies, Title 10 CSR 20-7.031, set MCLs and Secondary Maximum Contaminant Level (SMCL) which apply to the ground water underneath the WOU.

For example, the MCLs and SMCLs for several contaminants of concern in the WOU ground water are listed in Table 6.

Table 6. MCLs and SMCLs for Several Contaminants of Concern in the WOU Ground Water

Contaminant	MCL	SMCL
TCE	5 ppb	-
PCE	5 ppb	-
Methylene Chloride*	5 ppb	-
Barium*	1 ppm	-
Manganese	-	50 ppm

* Identified in the Risk Assessment as a potential risk to human health. Methylene Chloride was detected in only one sample in the RI and may be a laboratory contaminant.

2) The Federal Clean Air Act, 40 CFR § 50-99 and the State Implementation Plan (SIP), and the Missouri Air Quality Standards, 10 CSR 10.6, establish air quality standards which apply to air emissions released during WOU activities. In addition, the EPA Office of Air Quality Planning and Standards (OSWER) Directive 9355.0-28 specifies that air emissions controls will be utilized on Superfund sites when total VOC emissions exceed 10 tons/year for sites in non-attainment zones. This Directive is a <u>To Be Considered</u> standard which shall be followed since it is a non-promulgated document setting a level for emission necessary for protection. Refer to the Performance Standards subsection which follows the ARARs subsection for additional air emissions requirements.

3) There are no standard soil restoration levels. Instead, soil restoration levels are developed for each site. The soil restoration levels developed for the WOU are presented later in this section in the Performance Standards subsection.

Location-Specific

1) Due to the location within the 100 year flood plain of the Meramec River, the remedial activities will meet the substantive requirements of 40 CFR § 264.18(b) of the Resource, Conservation and Recovery Act (RCRA) as administered by MDNR.

2) In accordance with the Fish & Wildlife Coordination Act, Section 662, and the Endangered Species Act, the Missouri Conservation Commission and the U.S. Fish and Wildlife Service will be consulted prior to initiating any remedial activities. This step is required due to the potential impact of soil excavation activities on the surface waters of the Meramec River during a flooding event.

Action-Specific

1) Ground Water Monitoring:

The substantive ground water monitoring requirements apply as specified in 10 CSR 25-7.264 (1)(F).

2) Underground Injection of Ground Water and/or Air:

The substantive Underground Injection Control requirements apply as specified in 10 CSR 20-6.070, -6.090 and -6.011.

3) Discharge to POTW:

Any substantive and administrative requirements of 40 CFR § 403.5 and the local POTW pretreatment program will apply.

4) Installation of Ground Water Monitoring and Extraction Wells, Air Sparging Wells and SVE Wells:

The Missouri Well Construction Rules promulgated and existing under the authority of RSMo § 256.600 to 256.640.

5) Excavation, Transport and Disposal of Soils:

A MDNR hazardous waste transporter license, 10 CSR 25-6, will be required prior to excavating soil.

Additionally, the RCRA land disposal restrictions, 10 CSR 25-7.268, and the CERCLA Offsite Rule, 40 CFR

§ 300.440 of the NCP, 58 F.R. 49200 (9/26/93), apply to excavated soils.

6) Operation of SVE, Air Stripping and Air Sparging Systems:

The substantive requirements of the Missouri Air Quality Standards, 10 CSR 10.6, the Federal Clean Air Act, 40 CFR § 61 and 63 and the SIP, and Federal RCRA regulations 40 CFR § 264, Subparts AA and BB, will apply.

7) Excavation, Transport and Disposal of Soils:

Wastes disposed off-site or treated on-site will be sampled as per the substantive requirements of 10 CSR 25-7.264 (1)(B).

The substantive requirements of 10 CSR 20-6.200 (2)(B)3.A., involving storm water runoff control will apply.

Applicable Non-Environmental Laws

1) General Design and Construction:

The substantive requirements of the local St. Louis County and/or City of Valley Park zoning and building codes would be met prior to construction.

As per 10 CSR 25 7-270(2)(B)6, all submitted engineering plans and reports shall be approved by a registered professional engineer licensed by the State of Missouri; and the plans shall specify design standards as described in this regulation.

Performance Standards

Performance standards are technical criteria used in parallel to ARARs to make decisions during the design and/or implementation of remedial actions. Performance standards normally address issues for which there are no ARARs. The following list of performance standards apply to the remedial action options evaluated for the WOU:

Soil

Several treatment options evaluated address soil contamination. The contaminants of concern for the WOU are VOCs and PAHs in general, and PCE, TCE, and Benzo(a)pyrene, most notably. Soil performance standards are used to identify unacceptable concentration of contaminants in soil. There are no standard

soil performance standards which apply to all sites; instead, soil performance standards are developed for each site. For the WOU, direct contact to surface soils and migration from soils to ground water are unacceptable threats posed by contaminated soils. As a result, the soil performance standards are based on these two threats.

The methods used to develop the soil performance standards for the WOU are described in detail in Chapter two of the Final Feasibility Report for the Wainwright Operable Unit (May 9, 1994), Sections 2.2.2.1 and 2.2.2.2. These methods can be used to develop soil performance standards for all VOC and PAH contaminants of concern. For example, soil performance standards are presented for key contaminants at the WOU in Table 7.

Table 7. Soil Performance Standards for Key WOU Contaminants*

Contaminant	Ground Water Threat (PPM)	Direct Contact Threat (PPM)
Trichloroethylene	0.255	52.63
Perchloroethylene	0.737	10.64
Benzo(a)Pyrene	22.8	0.065

* As an example, Table 7 presents soil performance standards for only three contaminants. However, soil performance standards exist for all WOU contaminants using the method described above.

All surface and subsurface soils on the WOU must achieve the soil performance standards based on the threat to ground water prior to completion of the remedial action. However, surface soils on and off the WOU must achieve the soil performance standards based on the direct contact threat in a more expeditious timeframe than the performance standards based on the threat to ground water.

Air Emissions

The Missouri and Federal air emissions ARARs have been defined previously. In addition, the risks associated with the exposure to air emissions would be calculated during the design for the remedial action and used to determine the need for air emissions control equipment and ambient air remedial activities specified for Alternative 10. The EPA Industrial Source Complex Short Term or Long Term computer models (ISCST or ISCLT) or other EPA approved models will be used to develop the risk calculations for the soil and ground water remedial activities. MDOH will develop the ambient air performance standards for the contingency outlined in Alternative 10. The calculations will be based upon air emission exposures on and off the WOU which produce

acceptable risks: cancer risk less than 1 in 1,000,000 and non-cancer index less than 1.0.

SECTION 8.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

To select a remedy, all remedial alternatives must be compared to each other using nine evaluation criteria defined in Section 300.430(e) of the NCP. The nine criteria are divided into three groups: (1) Threshold Criteria include overall protection of human health and the environment and compliance with ARARs- alternatives which do not satisfy these criteria are eliminated; (2) Primary Balancing Criteria include long-term effectiveness and permanence, reduction of toxicity, mobility, or volume, short term effectiveness, implementability, and cost - these criteria are used to weigh major tradeoffs among alternatives; and, (3) Modifying Criteria include state acceptance and community acceptance - these criteria are taken into account after the public comment period. The selected remedy is the alternative that meets the threshold criteria and that then provides the best balance of trade-offs among the remaining criteria in this comparative analysis.

Threshold Criteria

- Overall Protection of Human Health and the Environment:

Alternative 1 is the no action alternative. This would not be protective of human health or the environment. Future use of the aquifer on the WOU poses unacceptable risks to public health. Contaminated soils pose a risk to neighboring residents, neighboring commercial business employees and tenants of the Wainwright property. Uncontrolled contaminated soils and ground water on the WOU would leach contaminants to ground water off the WOU. Alternative 1, therefore, is not considered further in this analysis.

Alternative 2 involves ground water monitoring and deed restrictions on ground water supply wells on the WOU. Contaminated surface soils would still pose a risk at the WOU, and contaminated soils and ground water on the WOU would still pose unacceptable risks to human health off the WOU. Therefore, Alternative 2 is not considered for further analysis.

Alternatives 3 and 10 reduce the risk to human health through soil excavation (or capping) and subsequent treatment/disposal off the WOU, soil vapor extraction on the WOU, ground water extraction and treatment (air stripping and discharge to a POTW) on the WOU, and air sparging on the WOU. Alternatives 3 and 10 would be the most protective of human health and the environment through relatively quick remediation of both the soil and ground

water exposure pathways. Only Alternatives 3 and 10 would reduce the risks from PAH contaminants in soils. Soil vapor extraction without excavation as indicated in Alternatives 4, 5, 6, 8, and 9 would not successfully remediate PAHs.

Alternatives 4, 5, 6, 8, and 9 also have components which would reduce exposure risks by remediating both the ground water and the soils of the WOU. Alternatives 4, 5, 6, 8, and 9 do not involve any excavation of soil and, therefore, would be less protective of human health during the extended time it would take to achieve cleanup goals for VOCs. Furthermore, alternatives which lack excavation may not effectively remove the soil exposure risk from PAH contaminants. Alternatives 6 and 9 do not involve air sparging which may decrease the likelihood of successfully treating the WOU ground water to achieve ARARs.

Alternatives 5 and 7 would remediate soils at the WOU but do not include ground water extraction (and subsequent air stripper treatment and POTW discharge). Some minor reduction of the ground water exposure route would be gained by air sparging and SVE in Alternative 5 and, to a lesser degree, by SVE without air sparging in Alternative 7. However, it is doubtful that VOCs could be reduced significantly in ground water to acceptable levels using Alternative 5, and highly unlikely using Alternative 7.

Only Alternative 10 directly monitors VOC contaminants found in ambient air within buildings on the WOU. Ambient air monitoring in the buildings would allow for a response action, if necessary, which would reduce unacceptable risks posed by WOU VOC contaminants.

All the proposed remedial alternatives that actively treat ground water limit the scope of ground water remediation to the ground water beneath the WOU. Therefore, ground water impacts off the WOU and associated risks to human health will not be fully eliminated by any of the proposed alternatives. Ground water contamination throughout the entire Valley Park area will be addressed in future actions in a separate operable unit.

-Compliance with ARARs:

Federal drinking water standards (MCLs) for TCE, PCE, and Methylene Chloride each are 5 ppb. The MCL for barium is 1000 ppb and the Secondary MCL for manganese is 50 ppm. Alternative 7 would not adequately achieve reduction of these chemicals in ground water and, therefore, is eliminated from further consideration. Alternative 5 may be able to achieve drinking water standards for VOCs, but not for barium and manganese. However, barium and manganese may not be a problem if future dissolved metals analysis show a reduction in these concentrations. Alternatives 3, 4, 6, 8, 9, and 10 all will

achieve federal and state drinking water standards for the ground water beneath the WOU only.

Alternatives 8 and 9 may not meet MDNR Underground Injection Control (UIC) prohibitions on reinjecting waste underground. Ground water reinjection is only permitted if it can be shown to significantly increase the efficiency of the ground water remediation process.

Alternatives 3, 4, 5, 6, 8, 9, and 10 will be designed to satisfy the substantive requirements for all location specific and action specific ARARs. Of specific concern are air emissions from the air stripper and SVE system which would be closely monitored and engineered to ensure compliance with all federal, state, and local standards.

Balancing Criteria

-Long-term Effectiveness and Permanence

For all the remaining alternatives, 3, 4, 5, 8, 9, and 10, untreated materials or long-term residual hazardous substances would not be expected to remain at the WOU assuming successful remediation of the soils and ground water.

Alternative 5 may prove less effective at treating ground water over the long-term than the other alternatives since it does not include ground water extraction. Often attaining cleanup goals with DNAPL contaminants is difficult over the long-term. For example, concentrations of TCE or PCE may decline during remediation, but often go back up when pumping ceases. Therefore, ground water remediation using both air sparging and ground water extraction, as included in Alternatives 3, 4, 8, and 10, may be more effective than Alternatives 6 and 9 in the long-term.

Alternatives 3 and 10 require treatment and disposal off the WOU for excavated soils. The treatment method used at the disposal facility could influence the long-term effectiveness of these alternatives.

Alternative 10 has the additional component of contaminant characterization and SVE concentrated along areas of horizontal conduits (buried utility lines). These areas are the most likely zones of contaminant migration and elevated concentrations. Therefore, focusing on these zones should increase the effectiveness of soil and subsequent ground water remediation.

-Reduction of Toxicity, Mobility, or Volume Through Treatment:

Under Alternative 3, approximately 350 cubic yards and under Alternative 10 approximately 95 cubic yards of soil would be

excavated and transported to an approved hazardous waste landfill facility. At the landfill, the soil would be treated using low temperature thermal desorption. This technology transfers VOCs from the soil to the air.

Alternatives 3, 4, 5, 6, 8, 9, and 10 involve transfer of VOCs from soil and ground water into the atmosphere. If permit requirements and/or acceptable risks for air emissions cannot be met, a portion of the VOCs will be treated through carbon adsorption or other permanent removal methods.

The mobility and volume of the contaminants in the soil and ground water would effectively be reduced under all of the remaining alternatives. However, these cleanup actions would not reduce the toxicity of the contaminants.

Alternatives 3, 4, 5, 6, 8, 9, and 10 satisfy the National Contingency Plan (NCP) preference for treatment.

-Short-term Effectiveness

Alternatives 3, 4, 5, 6, 8, 9, and 10 pose a short-term risk to remedial action workers on the WOU and neighboring residents through exposure to VOC vapors. Remedial Action workers should be protected by the use of appropriate personal protective equipment. Nearby residents should be protected by emissions and dust control, restricted access, and proper design and monitoring of SVE and air stripper systems. If air emissions permit limitations cannot be met and/or acceptable risks are not achieved, additional controls will be placed on these systems to protect public health.

A contingency plan would be developed for the WOU that includes procedures for protecting the public during an emergency.

Additional risks to remedial action workers may be presented by soil excavation included in Alternatives 3 and 10. Physical hazards during the excavation process would be mitigated by the use of proper protective gear and the implementation of a health and safety program.

Alternatives 3, 4, 5, 8, and 10 all include air sparging. It is possible that air forced into the ground water could cause ground water mounding and/or mobilize VOCs off the WOU along horizontal conduits (sewer lines or other buried utilities). In light of past concerns with vapors in neighboring households, strict controls would be placed on air sparging. Extensive pilot-scale studies would be conducted to ensure vapors are not transported off the WOU before full-scale implementation of air sparging.

Reinjection of ground water into the aquifer underneath the WOU included in Alternatives 8 and 9 would result in ground water

mounding, which may also cause mobilization of VOC vapors off the WOU. Reinjection and subsequent ground water mounding may also create changes in the hydraulic gradient which could mobilize contaminated water away from the extraction well. Extensive geologic characterization and careful design would be necessary to capture all the reinjected water.

Alternatives 3, 4, 6, and 10 would increase the load handled by the Valley Park MSD wastewater treatment facility. The normal inflow to the facility is 15 million gallons per day (MGD), which is 94% of its capacity. The effluent from the WOU ground water extraction would be 175 gpm or 0.25 MGD which is an extra 1.6% of the MSD facility's capacity. Also, the sanitary sewer line traversing the WOU property is an eight inch diameter pipe which could adequately receive the 175 gpm discharge. The WOU discharge would not significantly impact the capacity of the MSD, except during high flow conditions. The WOU ground water extraction system could be designed to shut down during flooding events which increase the flow to the POTW.

Environmental impacts for all the remaining alternatives would be low. Ground water extraction may alter hydraulic gradients locally, but should not negatively impact nearby water uses. SVE may increase VOC concentrations near the extraction wells, but this should not have any negative consequences. Air emissions should be of relatively low volume and not be a significant increase in the VOC load in the broader area. If VOC emissions exceed 10 tons per year or other permit limitations, engineered controls may be required to reduce emissions.

-Implementability

Implementation concerns for the remaining alternatives are relatively low. The equipment, materials and labor skills are readily available and the procedures to be followed are common.

There are some relative differences with implementation between the alternatives and technical difficulties associated with various remediation activities. These are listed below in order of decreasing difficulty in implementation (i.e. the most difficult first):

(1) Reinjection of ground water included in Alternatives 8 and 9, as mentioned above, must be very carefully designed to ensure capture of all ground water influenced by mounding. In addition, substantive requirements to satisfy stringent design parameters specified by the State UIC program may be prohibitive.

(2) Air sparging included in Alternatives 3, 4, 5, 8, and 10 also must be carefully designed and monitored to avoid migration of vapors underground away from soil vapor extraction wells. In addition, ground water must be below the base of the silty clay

soil horizon. If not, extraction of vapors through the SVE wells may be impeded.

(3) Elevated ground water may also pose a problem to the SVE system included in all the remaining alternatives. Vapors cannot be extracted through a saturated medium. In addition, the relatively tight silty clays in the upper soil zone may slow or inhibit the effectiveness of the SVE process. Specialized technology (i.e., soil fracturing) may be needed to assist in enhancing the SVE process in low permeability soils.

(4) Soil excavation and off-site disposal included in Alternatives 3 and 10 is a very common remediation technique. No problems in implementation should occur in this remedial action, unless adverse weather conditions (flooding) predominate during excavation.

-Cost

The estimated present-worth cost for the remaining alternatives are given below in Table 8 below:

TABLE 8. Costs of Remedial Alternatives

Alternative	Cost $
3	4,029,880
4	3,685,162
5	1,469,513
6	3,583,356
8	2,168,010
9	2,068,186
10	3,992,649

The present-worth cost estimates include direct and indirect capital costs, contingency allowances, and annual operation and maintenance costs projected throughout the estimated life of the project. Assumptions used in the cost estimates were an operational time frame of three years for soil venting and air sparging, 10 years for ground water pump and treat, and 30 years for ground water monitoring.

Modifying Criteria

-State Acceptance

The MDNR, representing the State of Missouri, supports the selected remedy described in Section 9.0, below.

-Community Acceptance

The reservations, concerns, and supporting or opposing comments of the community on the RI/FS, the Proposed Plan, and other information in the Administrative Record were made known to EPA and the State of Missouri during the thirty day comment period and at the public meeting. The public's comments are addressed in the responsiveness summary, which is a component of the Record of Decision (ROD) for the WOU. There have been no comments which required EPA to change the Preferred Alternative identified in the Proposed Plan.

SECTION 9.0 THE SELECTED REMEDY

The EPA has determined that the selected remedy for the WOU is Alternative 10. This selected remedy will provide overall protection of human health and the environment by eliminating, reducing, or controlling all current and potential risks posed by the exposure pathways at the WOU, and will be in compliance with all ARARs and Performance Standards. Alternatives 3 and 10 are the most protective of human health and the environment. However, Alternative 10 achieves an equal or greater level of protectiveness as Alternative 3, but with a potentially lower cost. Overall Protection of Human Health and the Environment and Long-Term Effectiveness and Permanence of the selected remedy were critical factors in balancing the trade-offs among the alternatives.

The selected remedy includes:

A. Soil vapor extraction (SVE) will be conducted throughout the identified areas of VOC contaminated soil on the WOU. SVE shall be conducted until VOCs are reduced to concentrations below the performance standards based on the threat to ground water. Additional characterization of horizontal migration pathways will be performed during the design of the remedial action. Special attention in the SVE design will focus on horizontal migration pathways, including the old sewer line through the WOU;

B. During the remedial design, surface soil samples, to be taken from the 0"-6" interval below surface grade, would be obtained from the Wainwright, Netzer, Cotton and St. Louis Boat and Canoe properties and analyzed for PAHs and VOCs. Based on these sampling results, surface soils with VOC and/or PAH levels exceeding the direct contact soil performance standards would be addressed in the following manner:

1. VOC-contaminated surface soils located on the Wainwright property would be covered to prevent contact without excavation occurring. At least a four inch layer of gravel was assumed for cost estimating

purposes. An uncontaminated soil cover could be used instead of gravel if mixing of the uncontaminated soil with contaminated soils would not complicate the remedial action. The contaminated surface soils must achieve the direct contact performance standards within five years from startup of the SVE system. If performance standards are not achieved within five years, a one foot depth of the original contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. The excavation would be backfilled to the original grade and revegetated consistent with the existing property;

2. PAH contaminated surface soils located on the Wainwright property would be excavated and taken to a treatment facility off the WOU. All PAH contaminated surface soils would be excavated until direct exposure performance standards could be met. For cost estimating purposes, it was assumed a one foot deep excavation would be required. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property.; and,

3. VOC and PAH contaminated surface soils located on the WOU but off the Wainwright property would be excavated to one foot below surface and taken to a treatment facility off the WOU. The excavation would be backfilled with clean soils to the original grade and revegetated consistent with the existing property.

For cost estimating purposes, it was estimated that 95 cubic yards of soil would require excavation and treatment. The technology identified for soil treatment at the hazardous waste treatment facility off the WOU is low temperature thermal desorption. This technology is assumed for cost estimating purposes. The final treatment technology selected for the excavated soil may change depending on the facility selected and is subject to MDNR and EPA approval;

C. A ground water extraction and treatment system which will hydraulically control the entire vertical section of the aquifer and restore to MCLs the impacted ground water underneath the WOU will be implemented. The extraction system will include at least one extraction well located on the WOU. Air stripping technology will be used to treat the extracted, contaminated ground water to meet POTW ARARs. The treated water will be discharged to the Metropolitan Sewer District POTW serving the City of Valley Park. The contaminated ground water located off the WOU will be addressed in a future operable unit of the larger Valley Park TCE Site;

D. An air sparging system would be installed to inject compressed air into the ground water below the area directly north of and beneath the Wainwright building. Intensive pilot scale studies are particularly necessary for this technology. Off-site, lateral migration of vapors through horizontal conduits, such as utility lines, would be studied during the design of the remedial action using pilot scale studies. If lateral vapor migration to horizontal conduits can not be controlled using SVE, the air sparging technology will not be included in the remedial action;

E. A deed restriction would be placed on the WOU by the property owners to prohibit the installation and operation of ground water supply wells on the WOU;

F. Ground water monitoring would be conducted to assess the effectiveness of the remediation. The monitoring well network would include existing and new ground water monitoring wells including a new set of two wells located directly north of the Wainwright building. One of the new wells would be finished to the top of bedrock to monitor the potential existence of free-phase DNAPL underneath the WOU. The second new well would be screened in the water table above the bedrock well; and,

G. Ambient air samples from the interior of buildings on the WOU will be analyzed for WOU contaminants during the remedial design. Missouri Department of Health health-based ambient air criteria will be used to determine the need for remedial actions to prevent unacceptable ambient air inhalation exposure risks.

The present worth cost estimate of $ 3,992,649 for the selected remedy includes estimates of $ 640,013 for total capital costs and $ 3,352,636 for operation and maintenance costs. The operation and maintenance costs are based on assumed operational time frames of three years for soil venting and air sparging, ten years for ground water pump and treat, and thirty years for ground water monitoring.

The EPA will conduct a five-year review, consistent with the standards set forth in Section 121(c) of CERCLA, 42 U.S.C. 9621(c). The effectiveness of the selected remedy will be re-evaluated at that time.

SECTION 10.0 STATUTORY DETERMINATIONS

Protection of Human Health and the Environment:

The selected remedy, through the use of ground water extraction and treatment, SVE, air sparging and soil excavation, treatment, and disposal will provide overall protection of human health and the environment. The above remediation methods used

in the selected remedy, as compared to the other alternatives, provides the most protection to human health and the environment by eliminating, reducing or controlling the potential risks posed by exposure to VOCs (notably, TCE & PCE), metals and PAHs at the WOU. The carcinogenic and non-carcinogenic risks from exposure to VOCs, metals and PAHs at the WOU will be reduced to within the acceptable levels. The selected remedy will not pose unacceptable short-term risks or cross-media impacts.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):

The selected remedy will comply with all federal and state ARARs as follows:

Contaminant specific:

1) For the ground water underneath the WOU only,

   A. Federal Safe Drinking Water Act (SDWA) MCLGs and MCLs, 40 CFR § 141.50 - 141.51 and 40 CFR § 141.11 - 141.16.

   B. Missouri Water Quality Standards for drinking water supplies, Title 10 CSR 20-7.031.

2) Federal Clean Air Act, 40 CFR § 50-99 and the State Implementation Plan, (SIP), and the Missouri Air Quality Standards, 10 CSR 10.6.

Location Specific:

1) 40 CFR § 264.18(b) of RCRA.

2) Section 662 of the Fish and Wildlife Coordination Act, and the Endangered Species Act.

Action Specific:

1) Substantive groundwater monitoring requirements of 10 CSR 25-7.264 (1)(F).

2) Substantive requirements of Underground Injection Control requirements in 10 CSR 20-6.070, -6.090 and -6.011.

3) Substantive and administrative requirements to be followed for 40 CFR § 403.5 and the POTW pretreatment program.

4) Missouri Well Construction Rules promulgated and existing under the authority of R.S. Mo. § 256.600-256.640.

5) 10 CSR 25-6, hazardous waste transporter license.

6) Land disposal restrictions, 10 CSR 25-7.268.

7) CERCLA off-site policy, 40 CFR § 300.440 of the NCP, 58 F.R. 49200 (9/26/93).

8) Substantive requirements of 10 CSR 10.6; Air Quality Standards, 40 CFR Parts 61 and 63 of the Clean Air Act and the SIP; and 40 CFR Part 264, Subparts AA and BB.

9) 10 CSR 25-7.264 (1)(B), sampling requirement.

10) 10 CSR 20-6.200 (2)(B)3.A, storm water runoff control.

To Be Considered (TBC):

1) EPA and the state of Missouri have agreed to follow procedures that are not legally binding because they are not promulgated. The EPA Office of Air Quality Planning and Standards (OSWER) Directive 9355.0-28 specifies air emissions controls for VOC emissions exceeding 10 tons/year for Superfund sites in non-attainment zones which will be followed.

Applicable Non-Environmental Laws

1) Substantive requirements of the local St. Louis county and/or City of Valley Park zoning and building codes.

2) 10 CSR 25 7-270 (2)(B) 6, engineering plans to be approved by a registered professional engineer.

Cost-effectiveness:

Although this remedy is one of the most costly, but not the most costly, it affords the most overall effectiveness proportional to its costs. As discussed in Section 8, the selected remedy is the most protective of human health and the environment through relatively quick remediation of both the soil and ground water exposure pathways. In addition, it affords more protection from exposure to contaminants than other alternatives by addressing potential ambient air, subsurface conduit and air sparging concerns.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable:

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The rationale for the selected remedy is as follows: the selected remedy offers the most long term effectiveness and reduction of toxicity, mobility and volume through treatment. Since this remedy is an interim remedy and not a final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element is partially addressed in this remedy. The statutory preference for the reduction of toxicity, mobility, or volume for the entire Valley Park TCE Site will be addressed in the final remedial action. The selected remedy is the only alternative, through SVE and contaminant characterization, that may reduce migration of contaminants along horizontal conduits. It is one of only two alternatives that offers a reduction in volume sooner than other alternatives through contaminated soil excavation and removal; it is potentially more cost effective than the other relatively accelerated remedial alternative.

Preference for Treatment:

The principal threats posed at this WOU are the threats posed by exposure to VOCs (notably, PCE and TCE), metals and PAHs by dermal contact and ingestion of contaminated soils and ground water, and by inhalation of vapors from soil and ground water contamination. The treatment methods chosen address the risks posed by ground water and soil contamination using treatment methods including soil excavation and removal, ground water extraction and monitoring, air stripping of extracted ground water, and air sparging with SVE.

SECTION 11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

There were no significant changes made to the Proposed Plan in this Record of Decision.

APPENDIX A

GLOSSARY

EPA used the following nine criteria, as specified in the **National Contingency Plan ("NCP")**, to evaluate alternatives identified in the FS. While overall protection of public health and the environment is the primary objective of the remedial action, the remedial alternative(s) selected for the Valley Park TCE Site must achieve the best balance among these evaluation criteria considering the scope and relative degree of contamination at the site.

1. **Overall Protection of Human Health and the Environment** -- in order for an alternative to be considered, it must be evaluated to determine if it adequately protects human health and the environment, in both the short and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site by eliminating, reducing, or controlling exposures to levels established during development of remediation goals.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** -- in order for an alternative to be considered, it must be assessed to determine if it attains ARARs under Federal environmental law and State environmental or facility citing laws or provide grounds for invoking a statutory waiver pursuant to CFR 300.430(f)(1)(ii)(C).

3. **Long-Term Effectiveness and Permanence** -- each alternative must be assessed to evaluate its ability to maintain reliable protection of human health and the environment over time once the cleanup goals have been met.

4. **Reduction of Toxicity, Mobility, or Volume** -- These are the three principal measures of the overall performance of an alternative. The 1986 amendments to the Superfund statute emphasize that, whenever possible, EPA should select a remedy that uses a treatment process to permanently reduce the level of toxicity of contaminants at the site; the spread of contaminants away from the source of contamination; and the volume or amount of contamination at the site.

5. **Short-Term Effectiveness** -- each alternative must be evaluated to assess the likelihood of adverse impacts on human health or the environment that may be posed during the construction and implementation of an alternative until the cleanup goals are achieved.

6. **Implementability** -- each alternative must be evaluated to determine whether it is feasible, technically and administratively. The availability of materials and service needed to implement the alternative are a part of this assessment.

7. **Cost** -- estimates are developed for the cost of implementing an alternative, as well as the cost of operating and maintaining the alternative over the long term, and the **net present worth** of both the capital and operation and maintenance costs.

8. **State Acceptance** -- addresses whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comments on the alternative EPA is proposing as the remedy for the site.

9. **Community Acceptance** -- addresses whether the public concurs with EPA's Proposed Plan. Community acceptance will be evaluated based on comments received at the upcoming public meeting and during the public comment period.

Terms Used in the Record of Decision

Administrative Order (AO): A legal and enforceable agreement signed between EPA and Potentially Responsible Parties (PRPs) whereby the PRPs agree to perform or pay for the cost of site response actions. The agreement describes actions to be taken at a site.

Applicable or Relevant and Appropriate Requirements (ARARs): ARARs include any State or Federal statute or regulation that pertains to protection of public health and the environment in addressing certain site conditions or using a particular cleanup technology at a Superfund site. MDNR and EPA must consider whether a remedial alternative meets ARARs as part of the process for selecting a cleanup alternative for a Superfund site.

Aquifer: A layer of rock or soil that can supply usable quantities of ground water to wells and springs. Aquifers can be a source of drinking water and provide water for other uses as well.

Carbon adsorption: A treatment system in which contaminants are removed from ground water or surface water by forcing water through tanks containing granular activated carbon, a specially treated material that attracts and binds the contaminants.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The acts created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either: 1) pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or, 2) take legal action to force parties responsible for site contamination to clean up the site or pay back

the Federal Government the cost of the cleanup.

Contaminants of Concern (COCs): Contaminants, identified during the site investigations and risk assessments, that pose a potential risk because of their toxicity and potential routes of exposure to public health and the environment.

Dense Non-Aqueous Phase Liquids (DNAPLs): A group of chemicals which are denser than water and do not dissolve in water easily. These chemicals include TCE and PCE and are common environmental contaminants which tend to migrate downward through soil until encountering an impervious layer.

Downgradient: Downstream from the flow of ground water. The term refers to ground water flow in the same way that it does to a river's flow.

Safe Drinking Water Standards: Safe Drinking Water Standards (SDWSs) for human ingestion specified in both the Federal Safe Drinking Water Act (SDWA) and the Missouri Water Quality Standards Title 10 CSR 20-7.031.

Ground water: Water, filling spaces between soil, sand, rock and gravel particles beneath the earth's surface, that often serves as a source of drinking water.

Maximum Contaminant Levels (MCLs): The maximum permissible level of a contaminant in water that is or may be consumed as drinking water. These levels are determined by EPA and are applicable to all public water supplies.

Migrate: To move from one area to another; to change location.

Monitoring Wells: Special wells installed at specific locations on or off a hazardous waste site where ground water can be sampled at selected depths and studied to determine such things as the direction in which the ground water flows and the types and concentrations of contaminants present.

National Contingency Plan (NCP): The Federal regulation that guides the Superfund program.

Present Worth: The amount of money necessary to secure the promise of future payment or series of payments at an assumed interest rate.

Operation and Maintenance (O&M): Activities conducted at a site after response actions occur, to ensure that the cleanup or containment system continues to be effective.

Organic Compounds: Chemical compounds composed primarily of carbon and hydrogen, including materials such as oils, pesti-

cides, and solvents.

Parts per Billion (ppb): A unit of measurement used to describe levels of contamination. For example, one gallon of a solvent in one billion gallons of water is equal to one part per billion.

Parts per Million (ppm): A unit of measurement used to describe levels of contamination. For example, one-half pound of contaminant in 250 tons of soil is equal to one part per million.

Poly-Aromatic Hydrocarbons: A group of semi-volatile organic chemicals commonly found as contaminants in soils.

Potentially Responsible Parties (PRPs): Any individual(s) or company(s), (such as owners, operators, transporters, or generators) who are potentially responsible for the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up a hazardous waste site.

Resource Conservation and Recovery Act (RCRA): RCRA is a Federal law that regulates the transportation, storage, treatment, and disposal of hazardous wastes.

Remedial Alternatives: The technology, or combination of technologies, used by EPA in treating, containing, or controlling contamination at a Superfund site.

Remedial Investigation/Feasibility Study (RI/FS): A two-part study that determines the nature and extent of the problem presented by the release and evaluates the options available for remedial action. The Remedial Investigation (RI) emphasizes data collection and site characterization and is typically performed concurrently with the Feasibility Study (FS). The FS emphasizes data analysis in conjunction with technologies available for consideration as remedial alternatives.

Sediments: The sand or mud found at the bottom and sides of bodies of water such as creeks, rivers, streams, lakes, swamps, and ponds. Sediments typically consist of relatively small soil particles (such as silt, clay, or sand) and organic (plant) matter. Gravel sized particles are sometimes included, as well.

Semi-Volatile Organic Compounds: A group of organic chemicals which have limited volatility. These chemicals are common environmental contaminants which often have a high affinity for soil.

Solvents: Liquids capable of dissolving other liquids or solids to form a solution. The chief uses of industrial solvents are as cleaners and degreasers. Solvents are also used in paints and pharmaceuticals. Many solvents are flammable and toxic to vary-

ing degrees.

Toxicity: A measure of the degree to which a substance is harmful to human and animal life.

Upgradient: This term refers to the direction of ground water flow in the same way that the term upstream refers to a river's flow.

VOCs: VOCs is an acronym for Volatile Organic Compounds. VOCs are a class of organic chemicals which tend to evaporate at normal atmospheric conditions. VOCs are typically man-made chemicals and have become ubiquitous in our daily lives.

RECORD OF DECISION

RESPONSIVENESS SUMMARY

VALLEY PARK TCE SITE

WAINWRIGHT OPERABLE UNIT

VALLEY PARK, MISSOURI

PREPARED BY:

MISSOURI DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

JEFFERSON CITY, MISSOURI

ON BEHALF OF:

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION VII

KANSAS CITY, KANSAS

SEPTEMBER, 1994

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RESPONSIVENESS SUMMARY
VALLEY PARK TCE SITE - WAINWRIGHT OPERABLE UNIT
VALLEY PARK, MISSOURI

1.0 OVERVIEW

In the Proposed Plan, the Missouri Department of Natural Resources (MDNR) in close association and with concurrence from the U.S. Environmental Protection Agency (EPA), made a preliminary selection of the preferred remedial alternative. The preferred remedial alternative addressed contaminated soil and ground water at the Wainwright Operable Unit (WOU). The treatment technologies included within the preferred alternative were soil vapor extraction, air sparging, ground water extraction and treatment, and limited excavation of surface soils contaminated with Polynuclear Aromatic Hydrocarbons (PAH) and the highest concentrations of Volatile Organic Compounds (VOC).

The comments received from interested citizens focused on the slow pace of the cleanup of the site, problems with past actions at the site, and payment of damages incurred as a result of the contamination from Wainwright Industries, Inc. Judging from the comments, the residents of Valley Park generally accepted the preferred alternative.

The Potentially Responsible Party (PRP) for the WOU, Wainwright Industries, Inc. (Wainwright), submitted two written comments. The PRP disagrees with the characterizations in the Proposed Plan that 1) the WOU is the sole source for the PCE and TCE ground water contamination, and 2) there is an association between the WOU and the ambient air contamination in the Cotton residence.

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT

The Remedial Investigation/Feasibility Study (RI/FS) and the Proposed Plan for the WOU were released to the public on August 14, 1994. The Administrative Record file, which included the RI/FS reports, the Proposed Plan and other relevant information on the WOU, was made available to the public at information repositories maintained at the City of Valley Park Public Library, the MDNR Hazardous Waste Program in Jefferson City, Missouri, and the EPA Region VII Superfund Records Center, Kansas City, Kansas. The notice of availability for these documents was published in the St. Louis Suburban Journals on August 14, 1994.

A public comment period was held from August 14, 1994 through September 12, 1994. A public meeting was held in Valley Park on August 24, 1994. Interested citizens were notified about the public meeting through the notice in the St. Louis Suburban

Journals and through letters sent to previously identified interested individuals by MDNR.

At the public meeting, representatives from MDNR, the Missouri Department of Health, and EPA presented information contained within the Proposed Plan and answered questions about the WOU. A transcript of the public meeting is available in the Administrative Record.

3.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

Comments received during the public comment period are summarized below. Responses to each comment are given immediately following the comment.

3.1 COMMENTS FROM INTERESTED CITIZENS

Comment #1

One commenter asked what the health effects may have been from ingesting contaminated ground water in the past?

Response

It is difficult to assess what the health effects from past ingestion of contaminated drinking water may be. The amount of time residents ingested contaminated water prior to discovery is unknown. Drinking water contamination was discovered initially in 1982. In 1982, the City of Valley Park began treating its drinking water with an aerator, which reduced contaminant concentrations. In 1986, the city upgraded its water treatment system to an air-stripper, which reduced concentrations to acceptable levels. In 1988, Valley Park began receiving water from St. Louis County, eliminating all exposure to VOC contaminants from drinking water. As a result, the exposure to contaminated drinking water potentially occurred from 1982 to 1988.

Ground water contamination levels increased significantly in the fall of 1983. This may indicate that the heart of the contamination plume had not reached the city wells prior to this date and that contamination prior to 1983 was relatively low.

Health effects of TCE and PCE are described in the Baseline Risk Assessment, which can be found in the Administrative Record for the WOU. Both contaminants are known or suspected carcinogens.

Comment #2

One commenter asked if the Wilcox property (located adjacent and northeast of the WOU) would be included in soil excavation and stated that no soil samples had been collected on the property.

Response

Soil samples that have been collected between Wainwright and the Wilcox property have been uncontaminated. It has been determined in the Remedial Investigation that contamination does not extend to the Wilcox property. Therefore, excavation at the Wilcox property is unnecessary.

Comment #3

One commenter was concerned about barrels on the Wainwright property that were there through the flood and have weeds growing around them.

Response

The drums at the Wainwright property are filled with drill cuttings from soil borings and monitoring well installation. MDNR sent a letter on September 14, 1994 to Wainwright requesting the disposal of the drums in an expedited time frame. Contractors for Wainwright have periodically cut weeds around the drums and will continue to do so.

Comment #4

One commenter complained that the removal action was done carelessly and that hazardous materials may have fallen out of the sides of trucks and tracked around town. The commenter continued to ask if past mistakes will be repeated in the future remedial action?

Response

In future remedial actions at the WOU, officials from MDNR and/or the EPA will be present to provide oversight. The MDNR and EPA presence will ensure that hazardous substances will be contained and that handling of hazardous substances will be done carefully.

The remedial actions presented in the Proposed Plan, will not increase truck traffic and waste handling at the WOU to the degree that occurred during the removal. The volume of soil excavated during the remedial action will be minimal and the other technologies require much less handling of hazardous materials.

Comment #5

The previous commenter stated that nearby residents were not adequately informed of the work conducted during the removal action.

Response

Prior to future remedial actions at the WOU, interested citizens will be notified by mail before the beginning of construction and the city council will be informed through the Wainwright/Valley Park Special Committee.

Comment #6

The previous commenter also inquired about the maximum depth of soil contamination and stated that the removal action was closed while contamination was present at a depth of 24 feet.

Response

Low levels of VOC contamination were detected during the Remedial Investigation to a depth of 35 feet.

The removal action was stopped because the contamination was considered too extensive for excavation to remove effectively. The soil vapor extraction system, which will be implemented during the remedial action, in addition to ground water extraction and air sparging should reduce contamination levels of deep soils.

Comment #7

Two commenters asked if ground water contamination of the City of Valley Park wells was caused by Wainwright?

Response

The Remedial Investigation indicated a clear link between TCE and PCE contamination of soils at Wainwright and ground water contamination. A previous investigation indicated that 1,1,1-TCA contamination probably originated from a source other than Wainwright. At this time MDNR and EPA consider Wainwright's past activities have contaminated ground water with TCE and PCE. However, there is another PRP responsible for the 1,1,1-TCA ground water contamination.

Comment #8

Two commenters asked why a business is still allowed to operate at the WOU with hazardous substances on the WOU and why residents are allowed to live near the contamination?

Response

The levels of contamination at the WOU are not high enough to constitute an immediate threat to public health or an emergency. There is not an acute risk. Health risks at the WOU are mainly from long-term exposures to soils. Ingestion of contaminated ground water would be the greatest health risk, but no one in Valley Park is still using the contaminated aquifer for drinking water or domestic uses. The areas with the highest levels of contamination have been excavated and hauled away during the removal action.

Since there is no environmental emergency at the WOU, EPA or MDNR do not have the authority to evacuate residents or close the business. Nor can EPA or MDNR impose zoning restrictions upon businesses. Zoning of residential and business areas is the province of local governments.

Comment #9

One commenter was concerned that the business operating on the Wainwright property may still use solvents or operate in a similar manner as Wainwright.

Response

There has been no evidence of TCE or PCE use or any spills since Wainwright left the property in 1979. The degreasers were removed in 1979 when Wainwright moved.

Comment #10

One commenter wanted to know if the hazardous substances were not acutely dangerous, why a warrant was placed for his arrest when he tried to enter the property during the removal action?

Response

Wainwright sought the warrant on the particular individual. Since EPA or MDNR did not take legal action to prevent anyone to enter the property, it is difficult to speculate on the reasons for the action. Access may have been controlled to prevent people from exposure to the hazards posed by a deep, open pit as

well as the hazardous substances on WOU, and to limit liability of Wainwright if people onsite fell into the pit.

Comment #11

One commenter asked what was the outcome of the survey of Valley Park residents conducted by the Missouri Department of Health (MDOH)?

Response

The study conducted by MDOH from February, 1992 through February, 1993 indicated there were no significant differences in cancer rates or other health effects from Valley Park residents and the outside population.

Comment #12

One commenter asked what adverse health effects could be expected for the people who worked at Wainwright for a period of 30 years or more?

Response

It is difficult to assess health effects on a case by case basis without knowing the details of the exposure. As a result, the Superfund process typically does not quantify historic exposures. However, in the Baseline Risk Assessment contained in the Remedial Investigation, an analysis was made of a scenario of an on-site worker incidentally ingesting and directly contacting soil, and inhaling volatilized compounds from soil for 25 years, 250 days per year. The assessment for this scenario indicated there would be no unacceptable non-carcinogenic risk, but there would be an increased cancer risk of 1.2×10^{-4} (1.2 in 10,000). Please refer to the Summary of Risks section of the Record of Decision for an explanation of the increased cancer risk value. This increased cancer risk is a conservative estimate based on a longterm exposure and does not constitute an acute hazard condition.

Comment #13

One commenter stated that after installation of the aeration system on the Valley Park municipal wells, the achievement of "acceptable limits" of contamination as determined by the government were not trusted by the public. The commenter went on to cite this as the reason for the city converting to the St. Louis County water supply. The commenter then asked what is being done to recoup the costs incurred by the city by converting to the county water supply?

Response

EPA and MDNR can and do seek to recover costs incurred through investigating and remediating abandoned or uncontrolled Superfund sites through the court system. EPA and MDNR do not have the authority to recover costs incurred by local governments or private individuals as a consequence of discharges at a Superfund site. Local governments and private citizens have the same right as EPA and MDNR to seek cost recovery from a potentially responsible party through the court system.

Comment #14

One commenter asked what recourse nearby residents have against Wainwright for the aggravation of living next to a Superfund site or having contamination on their property?

Response

Any individual interested in any private action should consult an attorney.

Comment #15

One commenter asked if a neighboring resident could put up a fence which has been down pending action at the WOU? The concern is that remedial action would begin soon and the fence would have to be taken down soon after being put back up.

Response

Any action at the WOU which would involve disturbance at a neighboring property would require restoration of that property to its former state. The remedial action may be as much as two years away from start up. Therefore, neighboring residents may make any improvements to their property they see fit without fear of interference from the remedial action.

Comment #16

One commenter asked what involvement the Missouri Attorney General's Office had with the site?

Response

Since the MDNR has the lead on the WOU, the Missouri Attorney General's Office (AGO) is responsible for representing the State of Missouri's legal interest in the WOU. The AGO is responsible

for negotiating consent decrees and other legally binding agreements with Wainwright or other PRPs for the site.

The AGO does not represent individual citizens or political subdivisions of the state (cities or counties).

Comment #17

A commenter asked what the legal steps are in deciding who would fund the clean-up and whether the clean-up would proceed regardless of who would fund the project?

Response

Following EPA signing the ROD, MDNR and/or EPA will enter into negotiations with Wainwright to conduct the selected remedy. The negotiations may last as long as 120 days. The goal is for Wainwright to commit, in a legal document called a consent decree, to conduct the selected remedy. If Wainwright does not sign the consent decree, EPA will initiate legal action to attempt to force Wainwright to implement the selected remedy.

If these legal actions fail and Wainwright is still recalcitrant, EPA will implement the selected remedy using federal funds. After the selected remedy is implemented, legal proceedings will again be initiated to recover the costs incurred by EPA in clean-up of the WOU.

Comment #18

A commenter stated that the removal action was four years ago and that no remedial work had been done at the WOU since then. The commenter then asked if there was any way to expedite the process?

Response

At this point in the process, the pace of the project will be determined by the degree of cooperation from Wainwright. If Wainwright chooses to be uncooperative, then the necessary legal proceedings or negotiations may significantly slow the pace of the project.

Comment #19

A commenter was concerned with the air sparging process and asked how often sampling would be conducted in nearby buildings to monitor the potential migration of VOC vapors into these structures.

Response

The exact frequency of air monitoring will be determined during the remedial design. There are air samplers available that are continuous monitors which can run 24-hours a day.

There are other precautions that can be used during remediation to prevent off-site migration of vapors. One method is to pull many times the volume of air out with the soil vapor extraction system than the volume of air pumped into the ground with the air sparging system.

Comment #20

A commenter asked whether another public meeting will be held when the remedial design is finished?

Response

There will not be another formal public meeting held. However, there will be meetings with city officials through the Wainwright/Valley Park Special Committee and nearby residents will be kept informed by mail.

Comment #21

A commenter asked if there was a chance for representation or participation from the general public in the negotiations with Wainwright?

Response

The actual negotiations and legal agreement are closed proceedings and not open to the public. However, if a consent decree is negotiated with Wainwright, a public comment period on that agreement would be opened with an associated responsiveness summary, prior to a court approving the agreement.

3.2 COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

Comment #1

The Proposed Plan implies that there is one source of PCE and TCE contamination for Valley Park located in the vicinity of the Wainwright property based upon conclusions from the Limited Remedial Investigation. Wainwright disputes that implication, based on well documented activities of other companies in Valley Park over several decades. The Proposed Plan deals only with the

WOU. Since additional investigations will be conducted for the greater Valley Park TCE Site, it is premature to conclude there is a single source of PCE and TCE contamination in Valley Park.

Response

The Proposed Plan does not state that Wainwright is the only source of PCE and TCE contamination in Valley Park. There is evidence of TCE and PCE contamination in various locations in the general Valley Park area which have not been related to the WOU at this time. However, the data from the Limited Remedial Investigation and the Remedial Investigation conducted by Wainwright's contractors does indicate contamination of the Valley Park municipal wells comes from a single ground water plume for PCE coinciding with a single plume of TCE contamination which begins in the vicinity of Wainwright.

The cluster of wells located immediately downgradient of Wainwright (17B & C) are the only wells where the shallow well is more contaminated than the deep well. Since PCE and TCE tend to sink to the bottom of an aquifer (move downward until a confining layer or relatively impermeable zone is encountered), the higher contamination of the shallower well indicates well cluster 17 is very near the source. The contamination at this location has not traveled far enough laterally to completely sink to the bottom of the aquifer. Soil contamination at the WOU which extends into areas of saturation is located less than 200 feet away from monitoring wells 17B and C.

Upgradient wells and soil boring from the WOU indicated a marked decline in concentration of contamination. This indicates no other sources of contamination upgradient of Wainwright.

EPA and MDNR have investigated other PRPs in Valley Park and have discovered no substantive evidence of other sources of PCE and TCE contamination related to the contamination of the Valley Park municipal wells. However, as stated in the comment from Wainwright, this Proposed Plan focuses only on the soil and ground water in the vicinity of the WOU. There is evidence that another PRP contributed 1,1,1-TCA contamination to the ground water.

Comment #2

The Proposed Plan refers to an association between the WOU and the Cotton residence, although it has not been established how the PCE allegedly detected would have gotten into the Cotton residence, nor has the origin of that PCE been established.

Response

The association between the WOU and the Cotton residence referred to in the comment and the Proposed Plan involves VOC vapors detected in the Cotton household. EPA contractors sampled the air in the home, after the Cotton's complained of odors coming up through the plumbing. These odors began entering the house after flood waters receded in the fall and winter of 1993 and into January 1994. Air sampling revealed the presence of many of the same contaminants found in the soils at Wainwright and which extended into the soil of the Cotton residence. The air contaminant with the highest concentration was PCE.

After the initial air monitoring, traps were installed in the plumbing of the house. Air monitoring was conducted again and indicated VOC vapor levels decreased in the household.

The air contamination at the Cotton residence is clearly connected with the soil contamination at the WOU. PCE and TCE are volatile chemicals. A VOC contamination plume will often consist of contaminated soil, contaminated ground water, and a soil-vapor plume. The raising and lowering of the ground water that occurs during and after a flood event will redistribute contamination in the soil and will tend to force VOC vapors in the soil upward to the surface and out from the location of original distribution. The original soil contamination at the Wainwright was discovered in the sewer lines. The sewer line and plumbing in the Cotton home are likely conduits for migration of vapors. All of these factors, combined with the fact that air sampling revealed many of the same contaminants present in soils at Wainwright, indicate a clear link of the VOC air contamination at the Cotton's residence with soil contamination at the WOU.