United States
Environmental Protection
Agency

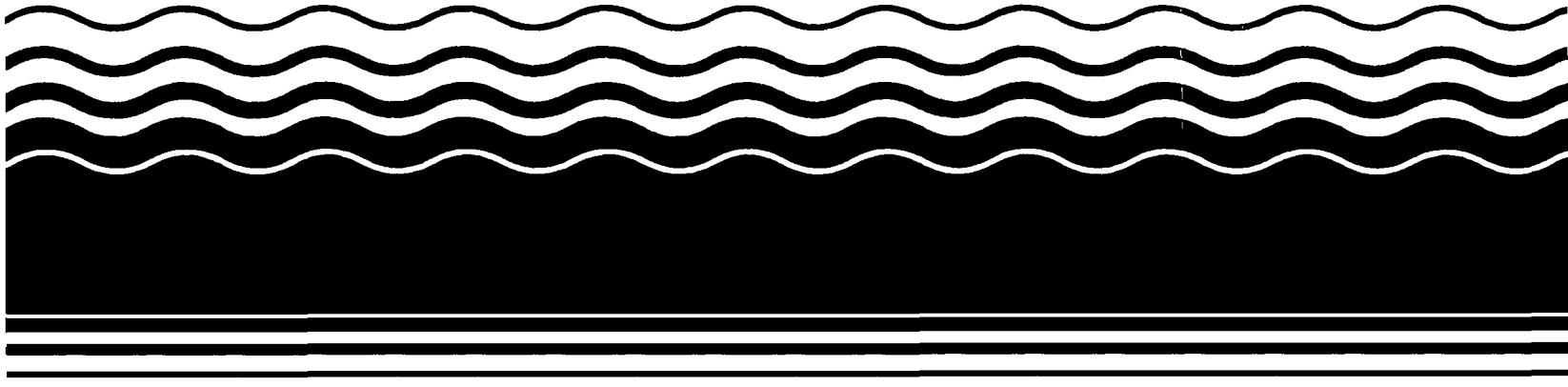
Office of
Emergency and
Remedial Response

EPA/ROD/R05-93/227
June 1993
PB94-964111

EPA

Superfund Record of Decision:

Spartan Chemical, MI



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SUPERFUND RECORD OF DECISION
Spartan Chemical, MI
First Remedial Action

5. Report Date 06/30/93

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16. Abstract (Limit: 200 words)

The 2-acre Spartan Chemical site is an inactive chemical transfer, blending, and repackaging plant located in Wyoming, Kent County, Michigan. Land use in the area is predominantly industrial, with some residences, a park, and a school located adjacent to the site. Prior to 1963, Spartan Chemical discharged process water containing a variety of chemicals, including aromatic and chlorinated solvents, napthas, alcohols, ketones, ethers, and lacquer thinners, directly to the ground water as part of its onsite operations. In 1975, ground water contamination was detected during dewatering operations at an adjacent facility. Discharge from the dewatering wells was found to contain various solvents and oils. This contamination was attributed to Spartan Chemical since it was the only known handler of solvents in the area at the time. In 1980, the State initiated a hydrogeological study that documented concentrations of organic chemicals in the ground water, which warranted a subsequent study to focus on the extent of offsite, downgradient migration of contamination. Between 1980 and 1985, a total of 38 monitoring wells were installed to evaluate the extent of onsite and offsite contamination. After a 1981 State investigation identified contamination in several private residential wells that were affected, these residents were connected to the public water supply. In 1984, the State required Spartan Chemical to investigate

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Spartan Chemical, MI
First Remedial Action
Contaminated Medium: gw
Key Contaminants: VOCs (ethylbenzene, 1,1,1-TCA, toluene, vinyl chloride, xylenes)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 22
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Abstract (Continued)

and clean up the ground water contamination at the site and, in 1986, to remove five chemical underground storage tanks. In 1988, the State required Spartan to establish a ground water collection and treatment system for which the company installed a steam stripper with an incinerator for off-gases. However, due to equipment problems, it was modified to an air stripper. In 1988, a purge well was installed onsite and began operation to control the migration of ground water contamination. In 1990, a second purge well was installed in an attempt to capture contaminated ground water. In 1992, Spartan Chemical declared bankruptcy, requiring the State to take the lead, under a cooperative agreement with EPA, and complete the investigation and cleanup. In 1992, EPA and the State proposed two remedial alternatives to the public: no action and continuation of the ground water collection and treatment system, which was shut down due to problems with the permit and temporary service agreement with the local POTW. Currently, the State is conducting semi-annual ground water sampling of select monitoring wells to evaluate trends in contaminant concentrations during system shutdown. This ROD addresses an interim remedy for continuation of the ground water collection and treatment system to contain the contaminant migration, but does not address ground water cleanup levels. Future RODs will address the ground water cleanup levels and any remaining source and ground water contamination, if necessary. The primary contaminants of concern affecting the ground water are VOCs, including ethylbenzene, 1,1,1-TCA, toluene, vinyl chloride, and xylenes.

The selected remedial action for this site includes evaluating and restarting the existing ground water collection and treatment system, including filtration, air stripping, and incineration of VOCs to reduce contamination levels and limit the migration of contaminants; evaluating several discharge options for treated ground water, including reinjecting back into the ground water, discharging to the city of Wyoming wastewater treatment plant, and directly discharging to the nearest surface water body; and monitoring ground water. The estimated present worth cost for this remedial action was not provided; however, the estimated annual O&M cost is $72,000.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water cleanup goals were not provided, but will be established at a later date.

DECLARATION FOR THE RECORD OF DECISION

SPARTAN CHEMICAL SUPERFUND SITE
WYOMING, KENT COUNTY, MICHIGAN

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for the contaminated groundwater for the Spartan Chemical site in Wyoming, Kent County, Michigan, which was 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 to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this site.

The U.S. Environmental Protection Agency (EPA) and the Michigan Department of Natural Resources (MDNR) agree on the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the interim response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Spartan Chemical site as specified in this interim action ROD addresses only the contaminated groundwater.

The interim remedial action for the groundwater consists of the following:

* Evaluation of the existing groundwater collection and treatment system and of discharge options available for the treated groundwater. The evaluation process may result in modifications to the existing treatment system and/or relocation of the discharge point;

* Restart of the existing groundwater collection and treatment system; and

* Groundwater monitoring to evaluate the effectiveness of the groundwater collection and treatment system.

Additional investigations will be required to better characterize the site, focusing on potential source areas, such as possible lagoons, chemical spill areas, and chemical storage tank areas. Further remedial actions may be required to address any remaining site concerns.

DECLARATION

This interim action is protective of human health and the environment, complies with or waives federal and state applicable or relevant and appropriate requirements (ARARs) for this limited-scope action, and is cost-effective. Although this interim action is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus is consistent with 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 further addressed by the final response action. Subsequent actions are planned to fully address the threats posed by the conditions at this site. Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an interim action ROD, review of this site and of this remedy will be ongoing as the MDNR, with assistance from the EPA, continues to characterize the site and to develop final remedial alternatives for the site cleanup.

6/29/93
Date

for Valdas V. Adamkus
Regional Administrator
U.S. EPA, Region 5

6/29/93
Date

Russell J. Harding
Deputy Director
Michigan Department of Natural Resources

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DECISION SUMMARY

SPARTAN CHEMICAL SUPERFUND SITE
WYOMING, KENT COUNTY, MICHIGAN

I. SITE LOCATION AND DESCRIPTION

The Spartan Chemical site (see Figure 1) is a 2-acre parcel located at 2539-28th Street in Wyoming, Michigan. It is situated among other small industries with a residential area and a city park located to the north of the site, and a school adjacent to it on the east side. The terrain in the vicinity of the site is relatively flat.

The company was a bulk chemical transfer, blending, and repackaging plant. During its operation, Spartan Chemical handled a variety of chemicals, including aromatic solvents, napthas, alcohols, ketones, ethers, chlorinated solvents, and lacquer thinners. A list of chemicals handled at Spartan Chemical and their relative volumes are shown in Table 1.

Approximately 30 storage tanks, five of which were underground, were utilized by Spartan Chemical for storage of chemicals. The above-ground tanks rest on concrete pads which are surrounded by containment walls. The underground storage tanks (USTs) were removed by the owner of Spartan Chemical under guidance of the MDNR, Environmental Response Division, Grand Rapids district office. Two USTs (6,000-gallon sections of a baffled 12,000-gallon tank) contained acetone and methyl ethyl ketone. Two other USTs, that were also sections of a baffled 12,000 gallon tank, contained isopropyl alcohol and acetone. The fifth UST was a 12,000 gallon tank that contained toluene. Contaminated soils associated with the USTs were not excavated as part of the removal. In addition to the USTs, other potential source areas exist at this site. Chemical spills and seepage from wastewater lagoons may also have contributed to the groundwater contamination. There is conflicting information available with regard to whether or not wastewater lagoons existed at this site. Further investigations of potential source areas will be required as part of future activities at the site.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site History

Prior to 1963, the company discharged its process water to the groundwater. The groundwater contamination was detected in December 1975 during dewatering operations at an adjacent facility. The dewatering was being done to lower the water table allowing for construction of a press pit. The discharge from these dewatering wells contained various solvents and oils. Spartan Chemical was the only known handler of solvents in the area at that time.

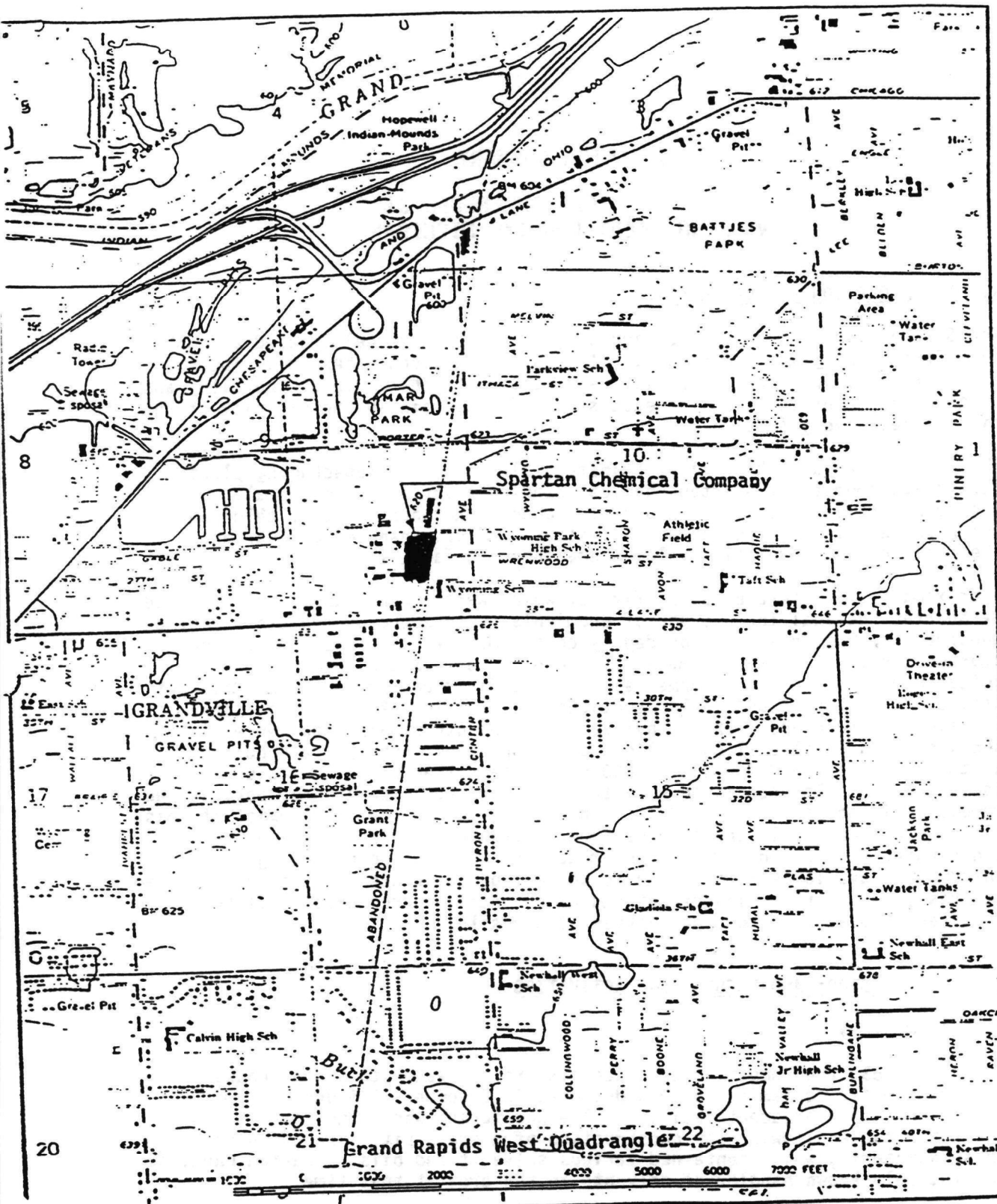


FIGURE 1
Area Topography (U.S.G.S. Quadrangle Map)
Spartan Chemical Company
Wyoming, Michigan Sec 9, T.12N, R.6W
Contour Interval = 10'

SOIL TESTING SERVICES OF MICHIGAN, INC.
2710 N. GRAND RIVER, LANSING, MICHIGAN 48906

TJK		9-3-81	70408

TABLE 1

CHEMICAL VOLUMES AT SPARTAN CHEMICAL COMPANY PLANT

Wyoming, Michigan

KEY:
1- High Volume
2- Medium Volume
3- Low Volume

CHEMICAL	VOLUME
Aromatic Solvents	
Toluol	1
Xylol	1
#100 Solvent	2
#150 Solvent	2
#3 Solvent	2
Aliphatic Naphthas	
Shell #140	3
V.M.&P. Naphtha EC	2
Mineral Spirits #135	2
Shell #340	3
Spartan Sol."B"	3
Tolusol #5	2
Shell Sol. 71	None
Alcohol	
Methanol	3
Isopropyl Alcohol 99%	2
Tecsol Anhydrous	2
N. Butyl Alcohol	3
N. Propyl Alcohol	2
Isobutyl Alcohol	3
Diacetone A.F.	3

CHEMICAL	VOLUME
Ketones	
Acetone	1
M.E.K.	2
M.I.B.K.	2
M.A.K.	3
M.P.K.	3
D.I.B.K.	3
E.A.K.	3
Tetrahydrofuran	3
D.M.F.	3
Esters	
Ethyl Acetate 99%	3
Ethyl Acetate 85-88%	2
Isopropyl Acetate	3
N. Propyl Acetate	2
Isobutyl Acetate	3
N. Butyl Acetate	3
I.B.I.B.	3
Ether Acetate	
Ek EE Acetate	3
EK EB Acetate	3

CHEMICAL	
Glycol Ethers	
Methyl Oxitol (EM)	3
Oxitol (EE)	3
Butyl Oxitol (EB)	3
Dioxitol (DE)	3
Butyl Dioxitol (DB)	3
Chlorinated Solvents	
Trichloroethylene	3
Perchloroethylene	3
Methylene Chloride	2
Tri-Ethane	2
Lacquer Thinners	
#16 Lac. Thinner	1
#1660 Lac. Thinner	3
#1060 Lac. Thinner	3
Wash Up Thinners	
#125 Wash Thinner	1
#10 Wash up Thinner	2
AMK Thinner	3

In 1981, the Kent County Health Department conducted a street survey to determine usage of residential wells north and downgradient of groundwater contamination detected at the site. Six homes showed no record of municipal water service. The private wells associated with these homes were subsequently tested by the health department and contamination was detected. According to the health department and information available to the MDNR, these homes have since been connected to the public water supply.

On September 8, 1983, Spartan Chemical was added to the National Priorities List (NPL) of environmentally contaminated sites, making it eligible to receive federal cleanup funds. In 1984, Spartan Chemical signed a consent order with the MDNR agreeing to conduct an investigation and cleanup of the contaminated groundwater at the site. However, due to bankruptcy of the company in February 1992, the MDNR has taken the lead to complete investigation and cleanup of the site under Superfund.

B. Previous Investigations

Site investigation activities were conducted by Spartan Chemical, under the direction of the MDNR, Environmental Response Division, Grand Rapids district office as discussed in the following paragraphs. This information was sufficient to support construction of an air stripper, which started operation in 1988.

A phase I hydrogeological study was initiated in 1980. The first reported groundwater data from three monitoring wells (Wells W, E, and N) showed that there were concentrations of organic chemicals in the groundwater that warranted a complete hydrogeological investigation to determine the extent of chemical migration beneath the site. In December 1980 and February 1981, additional groundwater samples were obtained from monitoring wells constructed previously and from new wells. The data from these monitoring wells are in Tables 2 and 3.

A phase II hydrogeological study conducted in 1981 focused on the extent of off-site, downgradient migration of contamination. Six (6) additional monitoring wells were installed further documenting the extent of groundwater contamination.

Additional wells were constructed in 1985 to expand the existing monitoring well network. Over the course of the groundwater investigations, a total of 38 monitoring wells (including two temporary wells) were installed to evaluate the extent of contamination.

In 1985, a Remedial Action Master Plan was completed by the engineering firm of Prein & Newhof for Spartan Chemical, which included a recommendation for a purge and treat system. A Remedial Action Plan was completed by EDI Engineering & Science, Inc. in 1987, which expanded on the 1985 report.

In 1988, an Aqua Detox steam stripper with an incinerator for off-gases was installed by Spartan Chemical. Due to equipment problems with the system in the steam mode of operation, it was modified to an air stripper. Two purge wells (PW-1 and PW-2) were installed, one on-site and one downgradient, to

TABLE 2

GROUNDWATER QUALITY ANALYSES DATA

Phase I
Sampling Dates: December 30 and 31, 1980
Spartan Chemical Company
Wyoming, Michigan
Sampled by STS Consultants, Ltd.

CHEMICAL PARAMETER	Well: N	W	E	OW-2	OW-3	OW-4	OW-6
C.O.D. mg/l	2,200	1,370	5,940	8	24	1,690	16
T.O.C. mg/l	370	139	1,600	11	5	450	15
Perchloroethylene ug/l	--	--	--	21	--	2,200	--
Trichloroethylene ug/l	--	--	--	16	--	2,500	--
Methyl Chloroform ug/l	--	--	--	46	--	12,000	--
Methylene Chloride ug/l	--	--	--	<1	--	18,000	--
1,2 Dichloroethane ug/l	--	--	--	<1	--	≤100*	--
Toluene ug/l	--	--	--	<1	--	100,000	--

*Interferences present preclude quantification below this concentration. The reported value is an upper limit of detectability established by the degree of interference.

TABLE 3

GROUNDWATER QUALITY ANALYSES DATA

Phase I
Sampling Date: February 20, 1981
Samples taken and analyzed by MDNR
Spartan Chemical Company
Wyoming, Michigan

CHEMICAL PARAMETER	Well: OW-1	OW-5	OW-7	OW-8
Trichloroethylene, ug/l	<1	<1	1,700	2,300
Methylchloroform, ug/l	<1	<1	4,800	2,800
Toluene, ug/l	<10	<10	>100,000	57,000
Benzene, ug/l	<10	<10	5,700	<1,000
Xylene, ug/l	<10	<10	19,000	15,000
1,2 Dichloroethane, ug/l	<1	<1	5,400	<100
Acetone, ug/l	ND	ND	ND	ND
Isopropanol, ug/l	ND	ND	ND	ND
Ethyl benzene, ug/l	<10	<10	7,400	5,000
Methylene Chloride, ug/l	ND	ND	TR	TR
Perchloroethylene, ug/l	<1	2	490	1,800
Trichloromethane, ug/l	<1	<1	660	<100
Chemical Oxygen Demand mg/l	<4	<4	1,030	115
Total Organic Carbon mg/l	11	5	300	56

ND- None detected to laboratory detection limits
TR- Trace, not quantifiable

control the migration of groundwater contamination. PW-2 (downgradient) was installed in June 1990 in an attempt to capture contaminated groundwater off-site.

A site assessment by the EPA Technical Assistance Team was conducted at Spartan Chemical on May 14, 1992. Five soil samples and one groundwater sample were collected for analysis. The samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds, and eleven priority pollutant metals (total). VOCs were detected in all of the samples, however, they were detected at levels below the EPA's removal action limits. Also, other contaminants detected in the samples did not justify an emergency removal action. The EPA also conducted a site reconnaissance, including an inspection of the above-ground tanks. The inspection of the above-ground tanks indicated that the tanks are almost empty with only residual solids and liquids remaining on the bottom of the tanks.

In November 1992, the EPA and the MDNR proposed two remedial alternatives (Alternative 1: No Action and Alternative 2: Continuation of Groundwater Collection and Treatment System) to the public for comment. Subsequent to the public comment period for these two alternatives, it was necessary to shut off the groundwater collection and treatment system. Please see Section XI. Documentation of Significant Changes for a discussion of this issue.

Currently, semi-annual groundwater sampling of select monitoring wells is being conducted by WW Engineering & Science, Inc., under direction of the MDNR. The purpose of this monitoring program is to evaluate the effectiveness of the treatment system and to provide information on the trends of contaminant concentrations.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

The major public participation activities are discussed in Section B of the Responsiveness Summary (attached to this document). As required under CERCLA Sections 113 (k)(2)(B)(i-v) and 117, a public meeting and public comment period were held on the preferred remedy as documented in the Proposed Plan for the site. The public comment period was held between November 18, 1992 and December 21, 1992. Comments received during this time period are discussed in the Responsiveness Summary.

There is a mailing list of local citizens and other interested individuals, including the media and public officials, who receive newsletters relating to site activities. The Proposed Plan and one information bulletin have been sent out.

IV. SCOPE AND ROLE OF RESPONSE ACTION

This interim action addresses only the groundwater contamination. Sufficient information exists to allow for selection of a groundwater collection and treatment system at this site. This interim action is intended to provide for

protection of human health and the environment by reducing additional migration of the groundwater contaminants.

This action will be consistent with future actions, to the extent practicable. Additional investigation of potential source areas is still necessary.

V. SITE CHARACTERISTICS

The geologic formations beneath the site are predominantly silty and gravelly sands. The direction of shallow groundwater flow is north-northwest and the rate of groundwater flow is estimated to be 1.4 feet per day.

Contaminants detected in the groundwater include various organics, such as toluene, ethylbenzene, xylenes, and 1,1,1-trichloroethane (1,1,1-TCA). Refer to Figure 2 for monitoring well locations and Table 4 for the groundwater sampling results obtained since 1986. The highest levels of contaminants have been detected in monitoring well 37, just south of the air stripper near PW-1. In April 1992, 110,000 parts per billion (ppb) of toluene, 33,000 ppb of xylene, 10,000 ppb of ethylbenzene, and 4,500 ppb of 1,1,1-TCA were detected in the groundwater at MW-37. Lower concentrations were detected during the September 1992 sampling round.

VI. SUMMARY OF SITE RISKS

Typically as part of the RI, a risk assessment is conducted to determine if on-site contamination could affect human health and the environment. A quantitative risk assessment was not completed for the groundwater contamination at this site. However, a qualitative risk assessment was performed by comparing groundwater contaminant concentrations to the Maximum Contaminant Levels (MCLs) in the Safe Drinking Water Act and the type B criteria in Michigan Act 307. Based on these comparisons, an assessment of the potential risks associated with groundwater was made.

Both the historic and the current groundwater data for the site clearly shows that there is a risk associated with the contaminant types and levels detected at this site. The contaminated aquifer is a potentially usable drinking water aquifer. The concentrations of several contaminants detected in the groundwater exceed the Maximum Contaminant Level identified for that particular compound, including toluene, xylene, 1,1,1-trichloroethane, and vinyl chloride. Several of the contaminant concentrations also exceed Michigan type B cleanup criteria as calculated pursuant to the Michigan Environmental Response Act (1982, P.A. 307, as amended) Administrative Rules. The comparison of site contaminants to type B criteria, which compares to a 10^{-6} risk level, was made only to evaluate the potential risk posed by the groundwater contamination. Because this is an interim action, no cleanup criteria have been selected for this site at this time.

Currently, the groundwater is not used as a source for drinking water, as residents within the zone of contamination, identified by ongoing groundwater

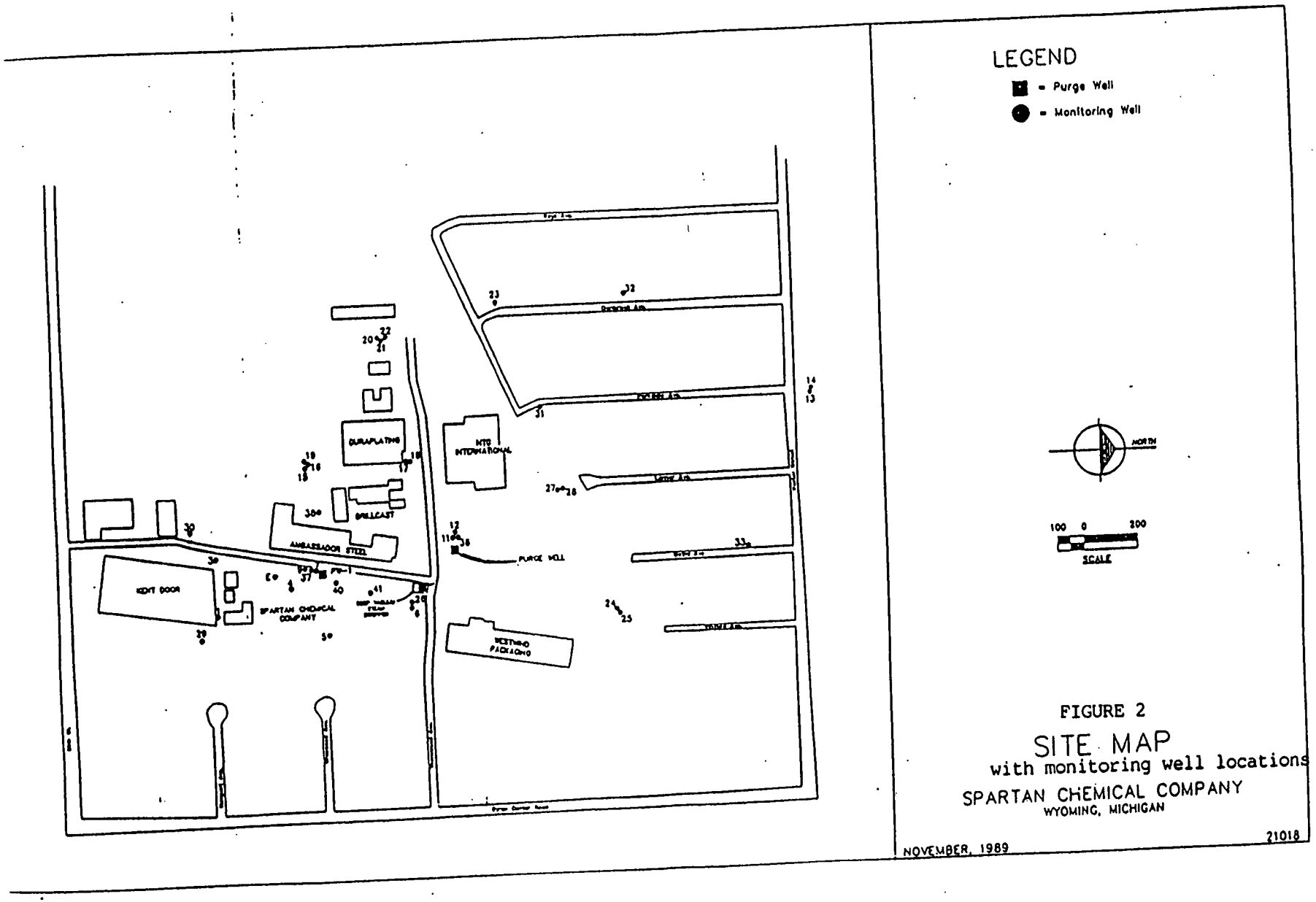


FIGURE 2

SITE MAP
with monitoring well locations

SPARTAN CHEMICAL COMPANY
WYOMING, MICHIGAN

NOVEMBER, 1989

21018

Table 4

SPARTAN CHEMICAL
GROUNDWATER MONITORING WELL/ANALYTICAL DATA
Summary Report
Units: ug/L

Compound Name	Minimum Concentration Detected	Maximum Concentration Detected	Maximum Contaminants Level (MCLs)	MICHIGAN TYPE B Levels
Benzene	N.D.	1600.0	5.0	1.0
Chlorobenzene	N.D.	780.0	N.A.	100.0
Chloroethane	N.D.	380.0	N.A.	9.0
Chloroform	N.D.	10000.0	100.0	6.0
Ethylbenzene	N.D.	12000.0	700.0	700.0
Methylene Chloride	N.D.	170.0	N.A.	5.0
1,1-Dichloroethane	N.D.	540.0	N.A.	700.0
1,2-Dichloroethane	N.D.	73.0	5.0	0.4
1,1-Dichlorethylene	N.D.	330.0	7.0	7.0
1,2-Dichloropropane	N.D.	140.0	5.0	0.5
Trans-1,2-Dichloroethylene	N.D.	13000.0	100.0	100.0
Tetrachloroethylene	N.D.	1100.0	5.0	0.7
Toluene	N.D.	260000.0	1000.0	1000.0
1,1,1-Trichloroethane	N.D.	6300.0	200.0	200.0
1,1,2-Trichloroethane	N.D.	46.0	5.0	0.6
Trichloroethylene	N.D.	1900.0	5.0	3.0
Vinyl Chloride	N.D.	210.0	2.0	0.02
Xylene	N.D.	41000.0	10000.0	10000.0

****

Key - N.D. = Not Detected
- N.A. = Data Not Available

monitoring, are utilizing a public water supply. Area residents may, however, use the groundwater for outdoor use (i.e., car washing and lawn sprinkling) and thereby expose themselves to a potential health risk.

Downgradient of Spartan Chemical is Lamar Park. Lamar Pond, which is used for various recreational activities, is located within the park. This pond has previously been sampled, with no indication of contamination.

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

VII. DESCRIPTION OF ALTERNATIVES

At the time the Proposed Plan was issued, two remedial alternatives were proposed for the interim action. These alternatives only address the contaminated groundwater and are:

Alternative 1 - No Action
The Superfund program requires that the "no action" alternative be considered at every site. Under this alternative, the existing groundwater collection and treatment system would be shut down, allowing for continued migration of groundwater contamination. No groundwater monitoring would be conducted.

There is no cost or operation and maintenance (O & M) associated with this alternative.

Alternative 2 - Continuation of Groundwater Collection and Treatment System
Operation of the groundwater collection and treatment system would continue in order to reduce concentrations of contaminants in the groundwater that exceed MCLs and Michigan's type B cleanup criteria and to reduce the migration of the groundwater contaminants. Groundwater sampling of certain monitoring wells would continue to allow for evaluation of contaminant concentrations, contaminant movement, and effectiveness of the system. Implementation of this alternative would not be a problem, since the treatment system with an incinerator for the treatment of off-gases and two purge wells are already in place.

The treatment system began operation in 1988. When in operation, the treated water was discharged to the city of Wyoming's sanitary sewer system, with treatment of volatile organic contaminants by the incinerator. The treatment system consists of the following major components:

1) In-line bag filter
2) Stripping tower
3) Catalytic incinerator
4) Effluent pump

The first component, the in-line bag filter, is designed to remove particulate matter from the groundwater before it enters the stripping tower. The filter bags are 150 micron mesh and are made of polyester. The second component, which is the stripping tower, is 5 feet in diameter and approximately 50 feet tall. The purged groundwater is pumped to the top of the tower and evenly spread over the diameter of the tower. As the groundwater cascades down through the tower, the contaminants are stripped from the groundwater by air that is passing up through the tower. The third component of the treatment system is the incinerator. It heats the air stream up to approximately 800°F. The heated stream then passes through a catalyst bed, where the contaminants are incinerated. The hot exhaust gases from the catalyst bed are then passed through a primary heat exchanger and then into the atmosphere through a 4 inch diameter stack at a point 24 feet above grade. The purpose of the effluent pump, the fourth component, is for recirculation, as well as for effluent discharge, depending on what is necessary. Refer to Figure 3 for a diagram of the treatment system.

Approximate O & M costs associated with the existing system are approximately $6,000 per month. This cost estimate does not account for potential discharge or design modifications that may impact the cost.

Subsequent to the public comment for these two alternatives, it was necessary to shut-off the groundwater collection and treatment system. Please see Section XI. Documentation of Significant Changes for a discussion of this issue.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

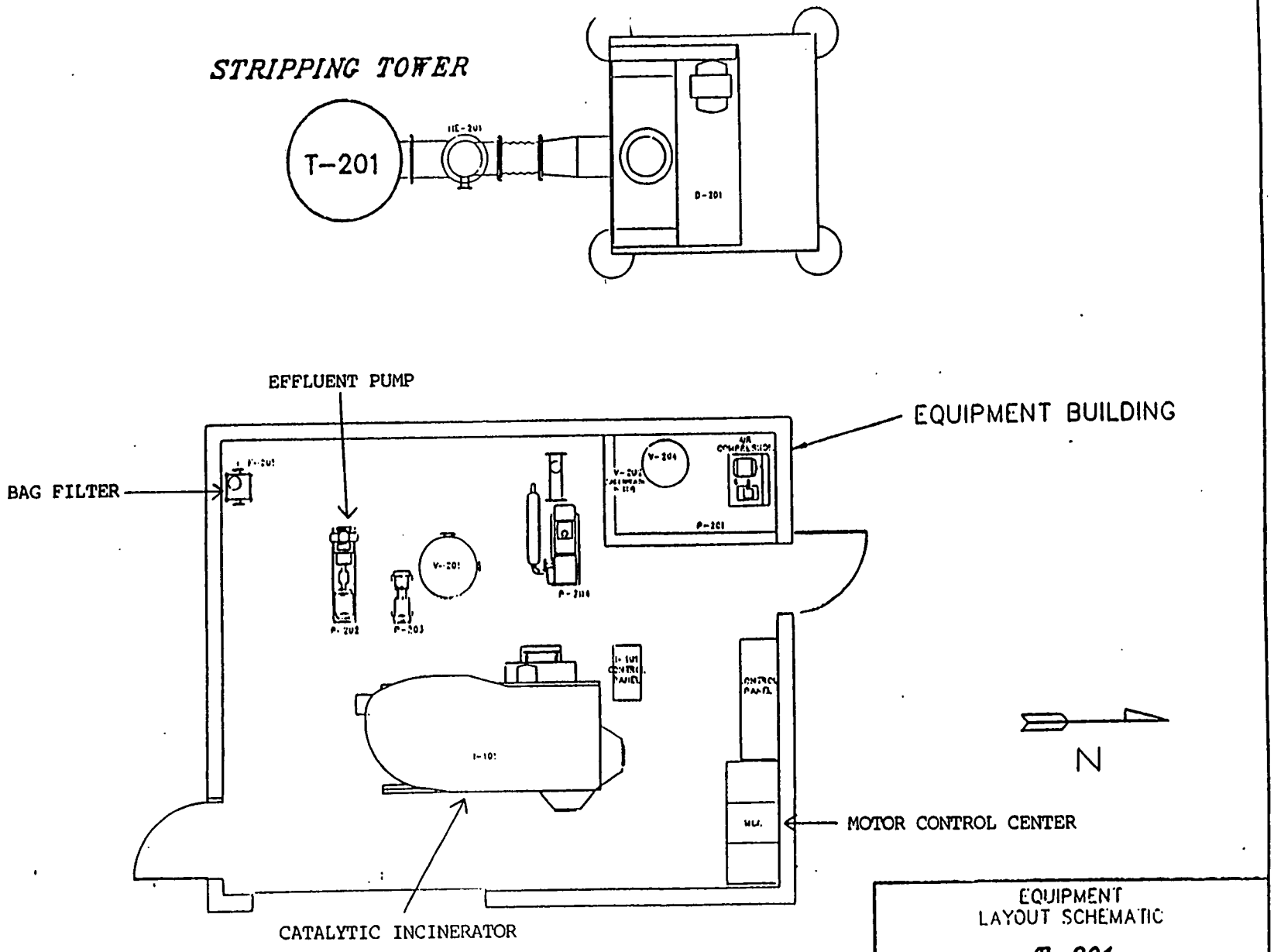
A. Evaluation Criteria

In order to determine the most appropriate alternative for the groundwater at the Spartan Chemical site, the alternatives were evaluated using the nine evaluation criteria, required under Superfund regulations. The nine criteria are summarized as follows:

1. Overall protection of human health and the environment addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether a remedy will meet all of the ARARs of other federal and state environmental laws and/or justifies a waiver of the regulation to implement the remedy.

3. Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.



EQUIPMENT
LAYOUT SCHEMATIC

T-201
STRIPPING TOWER

APRIL 1988 FIGURE 3 20758

4. **Reduction of toxicity, mobility, or volume through treatment** evaluates the anticipated performance of each treatment technology with respect to reduction or elimination of contamination toxicity, mobility, and volume.

5. **Short-term effectiveness** addresses the period of time needed to achieve protection, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period of each alternative.

6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated initial capital and O & M costs. Cost is also expressed as net present worth costs, which is the total cost of an alternative in terms of today's dollars.

8. **State/support agency acceptance** reflects aspects of the recommended alternative and other alternatives that the support agency favors or objects to, and any specific comments regarding ARARs or the proposed use of waivers.

9. **Community acceptance** summarizes the public's general response to the alternatives described in the Proposed Plan, based on public comments received. Evaluations under this criterion are usually not completed until after the public comment period on the Proposed Plan.

B. Comparative Analysis

The "no action" alternative is not protective of human health and would not meet state and federal ARARs. For these reasons, it is not available for selection as the groundwater remedy, and will not be carried through the evaluation process against the nine criteria as described above. The following comparative analysis discusses Alternative 2 only, assessing its performance, should the system be restarted and operation continued, against the nine evaluation criteria.

1. Overall Protection of Human Health and the Environment
Operation of the treatment system would reduce potential threats to human health and the environment by reducing the spread of groundwater contamination while not releasing contaminants to the air because of incineration of the off-gases.

2. Compliance with ARARs
An interim action ARAR waiver is being invoked for this interim response action for groundwater cleanup criteria. The final groundwater response action will comply with federal and state ARARs or provide justification for a waiver. This interim action will comply with ARARs relating to discharge of the treated groundwater, disposal of any treatment residuals, and any air emissions from the groundwater treatment system.

3. Long-term Effectiveness and Permanence
This criterion is not applicable at this time. A further and more complete evaluation of the site remedy will be conducted after completion of additional site investigation activities.

4. Reduction of Toxicity, Mobility, or Volume
Contaminant toxicity, mobility, and volume would be reduced by treatment of the contaminated groundwater.

5. Short-term Effectiveness
Prior to the shutdown of the groundwater collection and treatment system discussed in Section XI. Documentation of Significant Changes the air stripper system was operating to contain the contaminant plume. The shutdown and future evaluation of the groundwater collection and treatment system may create some short-term problems. The shutdown may result in the further migration of the contaminant plume. This condition is presently being monitored at the site. The evaluation of possible future modifications to the groundwater collection and treatment system and changes in the treated groundwater discharge points may result in a short delay in achieving containment of the contaminant plume.

6. Implementability
Prior to the shutdown of the groundwater collection and treatment system discussed in Section XI. Documentation of Significant Changes, the system was fully operational and this criterion was not applicable. The shutdown of the system and the possible modifications and options for discharge being considered to restart the system may present future implementation problems. These problems would be primarily associated with obtaining approvals (i.e., permitting requirements) from and coordinating with other agencies.

7. Cost
When Alternative 2 was presented in the Proposed Plan to the public, no construction costs were anticipated for implementation of this alternative. Now that the system is shut down, an evaluation of system modifications and various discharge options for treated groundwater is required. This evaluation process may result in modifications to the treatment system and/or location of the discharge point. Any modifications would likely result in construction costs. However, these costs are expected to be minimal since the primary treatment system is in place.

The approximate cost for O & M associated with the existing groundwater collection and treatment system and groundwater monitoring is $6000 per month. Changes resulting from the evaluation of the current system may impact the cost of O & M.

8. State Acceptance
The MDNR was the lead agency for preparing the Proposed Plan and the ROD. The MDNR recommends the selection of Alternative 2: Continuation of the Groundwater Collection and Treatment System, with some modifications. The EPA agrees with MDNR recommendations.

9. Community Acceptance

Overall the community supports continued treatment of the groundwater. However, there were some concerns expressed with regard to air emissions from the treatment system. Air emissions are treated by an incinerator before discharge to the air. See the attached Responsiveness Summary for a full discussion regarding Community Acceptance.

IX. SELECTED REMEDY

The selected interim groundwater remedy for this site is Alternative 2 with some modifications. The major components of the selected interim remedial action include:

* Evaluation of the existing groundwater collection and treatment system and of discharge options available for the treated groundwater. The evaluation process may result in modifications to the existing treatment system and/or relocation of the discharge point;

* Restart of the existing groundwater collection and treatment system; and

* Groundwater monitoring to evaluate the effectiveness of the groundwater collection and treatment system.

Additional site investigations will be required to better characterize the site, focusing on potential source areas. Further remedial actions may also be required to address any remaining site concerns.

Operation of the groundwater collection and treatment system provides the best solution to the groundwater contamination, even though the current non-operational status of the system may present some short-term effectiveness and implementability concerns before the system is operational again. Cost associated with any modifications would be minimal since the primary system is in place. Based on a comparison of the two alternatives to the nine evaluation criteria and the fact that the system is in place, Alternative 2 with potential system and discharge modifications provides the best solution to the groundwater contamination problems. Potential discharge options are discussed in Section XI. Documentation of Significant Changes.

X. STATUTORY DETERMINATIONS

The selected remedy must satisfy the requirements of Section 121 (a-e) of CERCLA. The requirements specify that a remedy: a) Protect human health and the environment; b) comply with ARARs; or provide justification for a waiver; c) be cost-effective; d) utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and e) satisfy a preference for treatment as a principal element of the remedy. The implementation of

Alternative 2, with modifications, at Spartan Chemical satisfies these requirements of CERCLA as detailed below:

A. Protection of Human Health and the Environment

Implementation of the selected remedy will reduce and control potential risks to human health and the environment by controlling the further migration of contamination off-site and treating on-site groundwater contamination.

Protection of human health and the environment will be achieved by future response actions at this site to address contaminated soils that may be an on-going source to the groundwater contamination.

B. Compliance with ARARs

An interim action waiver is being invoked for this response action for groundwater cleanup criteria. The final groundwater response action will comply with federal and state ARARs or provide justification for a waiver. This interim action will comply with ARARs relating to the discharge of the treated groundwater, disposal of any treatment residuals, and any air emissions from the groundwater treatment system.

ARARs relating to the discharge of treated groundwater to surface water include the Clean Water Act of 1977, as amended (33 U.S.C. 1251) and the Water Resources Commission Act, 1929 P.A. 245, as amended, Part 4, Rule 57 - Water Quality Standards. ARARs relating to the discharge of treated groundwater to the ground include the Water Resources Commission Act, 1929 P.A. 245, as amended, Part 21 - Wastewater Discharge Permits.

ARARs relating to the disposal of any treatment residuals include the Resource Conservation and Recovery Act of 1976.

ARARs relating to the air emissions from the operation of the incinerator system include the Clean Air Act of 1963, as amended (42 U.S.C. 7401), 40 CFR 50 - National Primary and Secondary Ambient Air Quality Standards; the Clean Air Act of 1963, as amended (42 U.S.C. 7401), 40 CFR 61 - National Emission Standards for Hazardous Air Pollutants; and the Air Pollution Act, 1965 P.A. 348, as amended, Parts 3, 7, and 9.

C. Cost-effectiveness

The selected remedy is cost-effective, since construction of the primary treatment system has already been completed by the owner of Spartan Chemical, prior to bankruptcy of the company.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The MDNR and the EPA believe that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for this interim action.

E. Preference for Treatment as a Principal Element

This preference is addressed in the interim action since groundwater is being treated. This preference will be further addressed in the final decision document for this site.

XI. DOCUMENTATION OF SIGNIFICANT CHANGES

In January 1993, subsequent to the close of the public comment period, the treatment system was shut down because of unresolved problems regarding the renewal of the discharge service agreement with the city of Wyoming. A service agreement (or permit) was needed to continue discharging treated groundwater to the city of Wyoming wastewater treatment plant. In brief, the main unresolved issues are: 1) the state cannot legally sign a new service agreement or permit because the city is now requiring indemnification language, and 2) the treatment system was unable to meet the discharge limits being imposed by the city in the new agreement.

It will be necessary to evaluate options for upgrade of the existing system and discharge of treated groundwater before the system can be put back in operation. The discharge options that will likely be included in the evaluation are; (1) reinjection back into the groundwater, (2) discharge to the city of Wyoming wastewater treatment plant, and (3) direct discharge to the nearest surface water body which requires satisfying the state requirements for a National Pollutant Discharge Elimination System (NPDES) permit. These options are presented here for information purposes only, and another option may be evaluated, and possibly chosen, for discharge of the treated groundwater. Any option chosen will comply with ARARs or a waiver will be invoked.

Upon completion of the entire evaluation process, additional design activities may be necessary to achieve an effective and complete groundwater treatment system.