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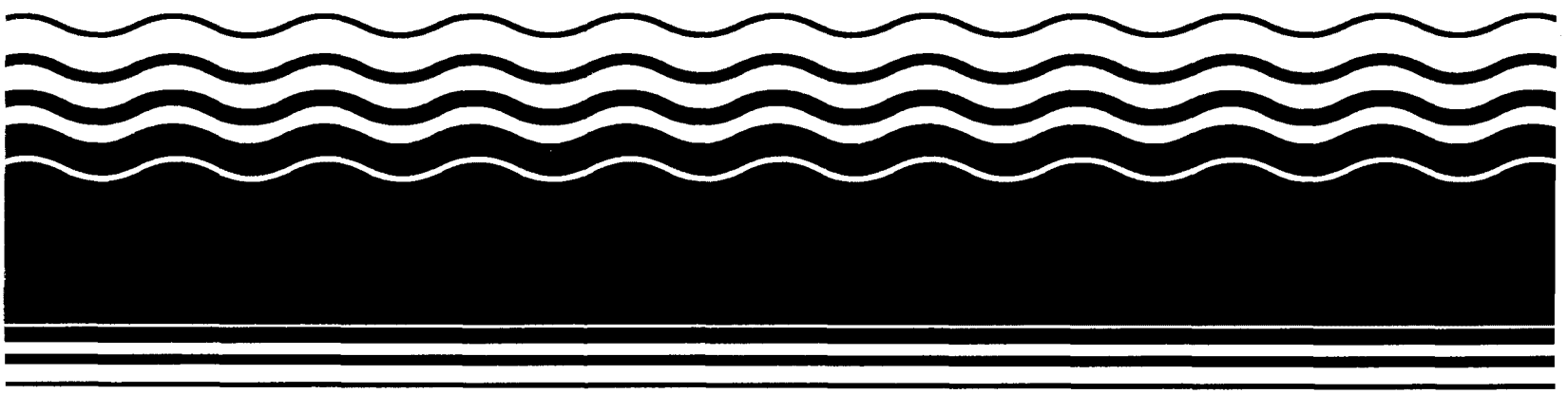
EPA/541/R-97/188
January 1998

EPA Superfund Record of Decision:

Newsom Brothers/Old Reichhold Chemicals, OU 2 Columbia, MS 8/8/1997



DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Newsom Brothers Site - Operable Unit 2 (North Pond)
Columbia, Mississippi

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected response action for Operable Unit 2 (OU2) at the Newsom Brothers Site (Site) in Columbia, Mississippi. This remedy for the Site 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) 42 U.S.C. Section 9601 et.seq, and the National Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the administrative record file for this Site.

In accordance with 40 CFR 300.430, the State of Mississippi, as represented by the Mississippi Department of Environmental Quality (MDEQ), has been the support agency during the Remedial Investigation for Operable Unit 2 (OU2 RI) at the Site. The Environmental Protection Agency (EPA) has received a formal letter of concurrence from MDEQ.

DESCRIPTION OF THE SELECTED REMEDY

This ROD applies to the groundwater contamination and subsurface soil contamination beneath the North Pond areas which constitutes OU2 of the Site. Contaminated soils and sediments were removed from the Site as part of the remedial action for Operable Unit 1 (OU1) and the source for groundwater contamination therefore no longer exists at the Site. The groundwater at OU2 was thoroughly characterized during the OU2 Remedial Investigation (RI). Sampling revealed only sporadic, isolated sample results in exceedance of any health-based Maximum Contaminant Levels (MCLS), and no discernable plume can be identified. Those MCL exceedances occurred only within the boundaries of OU2 or in the immediate vicinity of OU2, and sampling establishes that contamination has not migrated outside that area. There is no current on-site exposure pathway because the contaminated soil has been removed and the Site is serviced by the municipal water supply. There is no current off-site exposure pathway for the groundwater because groundwater contamination has not migrated off-site. Finally, there is no future exposure pathway for the groundwater because there is no evidence that the limited groundwater contamination is migrating, because the entire area is serviced by the municipal water supply, and because future installation of private water supply wells is unrealistic. Because of the limited and sporadic nature of the groundwater contamination and because no exposure pathway

exists, EPA has determined that no remedial action is required to address OU2. However, to further ensure that Site conditions remain constant, EPA will initiate a three year groundwater monitoring plan.

EPA will require quarterly monitoring during the first year and semi-annual monitoring during years two and three.

If groundwater monitoring indicates that the Site poses a threat to human health or the environment, EPA, in consultation with the State of Mississippi, will reconsider the feasibility of groundwater remediation. If the groundwater monitoring indicates that the Site no longer presents a threat to human health and the environment, monitoring will terminate after the three year period.

DECLARATION STATEMENT

Based on the results of the OU2 RI and Risk Assessment conducted for OU2, EPA has decided that no action with monitoring is necessary to protect human health and the environment. EPA plans no further response actions at the Site unless the groundwater monitoring indicates the presence of contaminants remaining onsite above health based levels. EPA has determined that with the exception of supplemental groundwater monitoring, its response at this Site is complete.

8 AUG 97

Richard D. Green, Acting Director — Date
Waste Management Division

RECORD OF DECISION

Summary of Remedial Alternative Selection

NEWSOM BROTHERS SITE

Columbia, Mississippi

Prepared by:
U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

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DECISION SUMMARY FOR THE RECORD OF DECISION OPERABLE UNIT TWO (OU2) NEWSOM BROTHERS SITE COLUMBIA, MISSISSIPPI

1.0 SITE NAME, LOCATION, AND DESCRIPTION

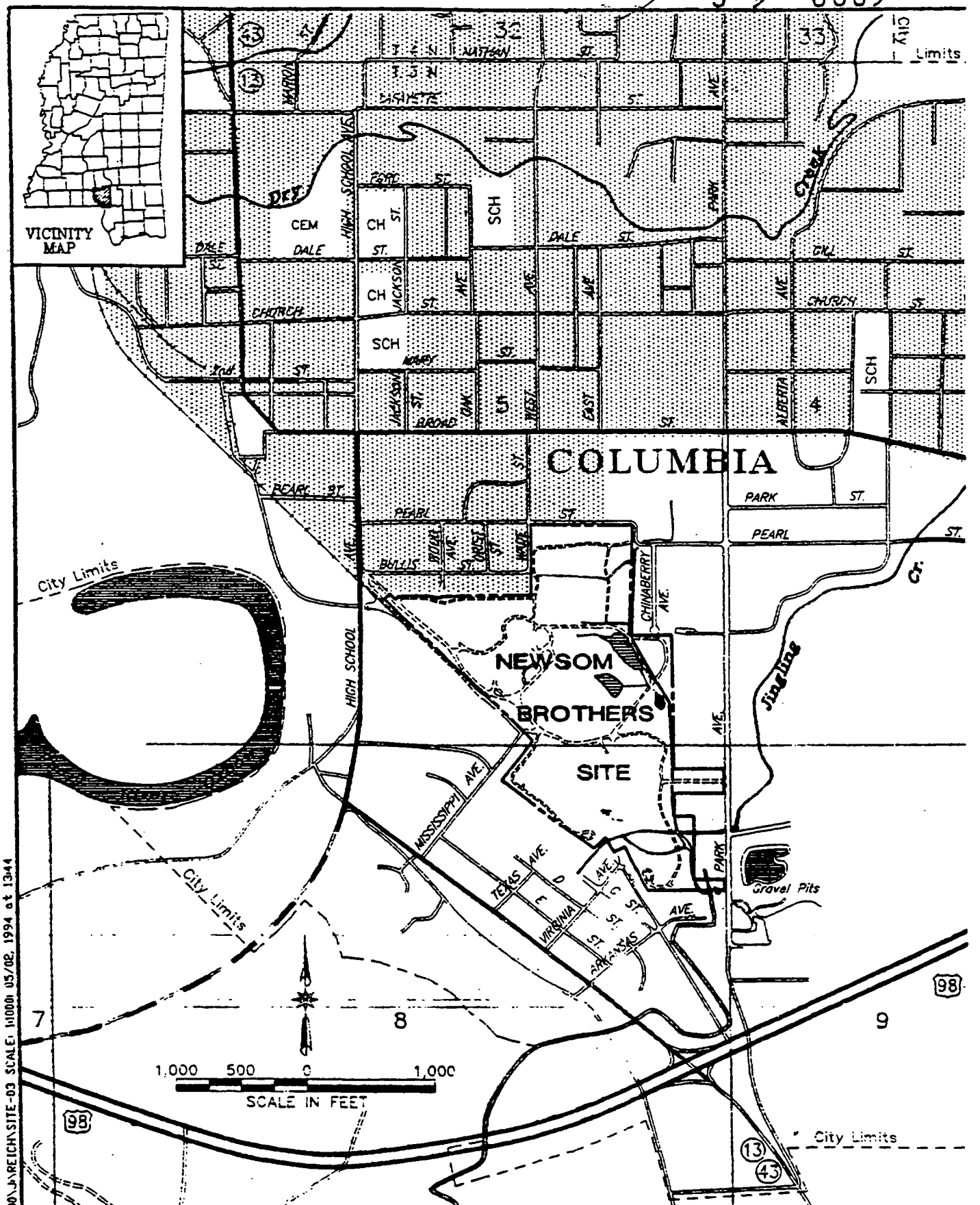
The Newsom Brothers Site (Site) is located in Columbia, Marion County, Mississippi (Fig 1). The 81-acre Site is surrounded by residential neighborhoods which, in some cases, are located directly adjacent to the Site boundaries. There are numerous businesses located along High School Avenue which borders the western boundary of the Site. The Site is completely fenced and access to the Site is restricted.

The North Pond Area is located in the northeast corner of the Site adjacent to the Site boundary near Chinaberry Street (Figure 2). The North Pond Area is completely fenced and marked. No structures are located within the North Pond Area and the ground is covered with thick vegetation.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site was used for industrial and commercial activities for over 50 years. From the early 1930s until 1943, J.J. White Lumber Company operated a sawmill on the Site. The Southern Naval Stores Company, Limited, [illegible] ran an operation, called Naval Stores, [illegible] the Site, from 1936 to 1951. Naval Stores produced wood derivatives such as resin, turpentine, pine oil, and tall oil. The ownership and operation of Naval Stores changed several times between 1936 and 1951, but the plant consistently produced the same wood-derived products. From the 1950s until 1965, the Site was owned and operated by Leach Brothers, Incorporated. Reasor Chemical Corporation owned the Site from 1965 to 1972, and Chem-Pro International Inc. owned it from 1972 to 1974.

Southern Naval Stores Company, Reasor Chemical Corporation, and Chem-Pro International ran similar production processes. These processes involved grinding pine stumps and digesting them with a boiling liquor of sodium hydroxide and sodium sulfite. The products were tall oils, which are 35 to 40 percent resin and 50 to 60 percent fatty acids. Turpentine was also extracted from the pine stumps using naptha. In addition, Reasor Chemical Corporation specifically manufactured calcium and zinc resinates, polymerized resin, and rubber resins.



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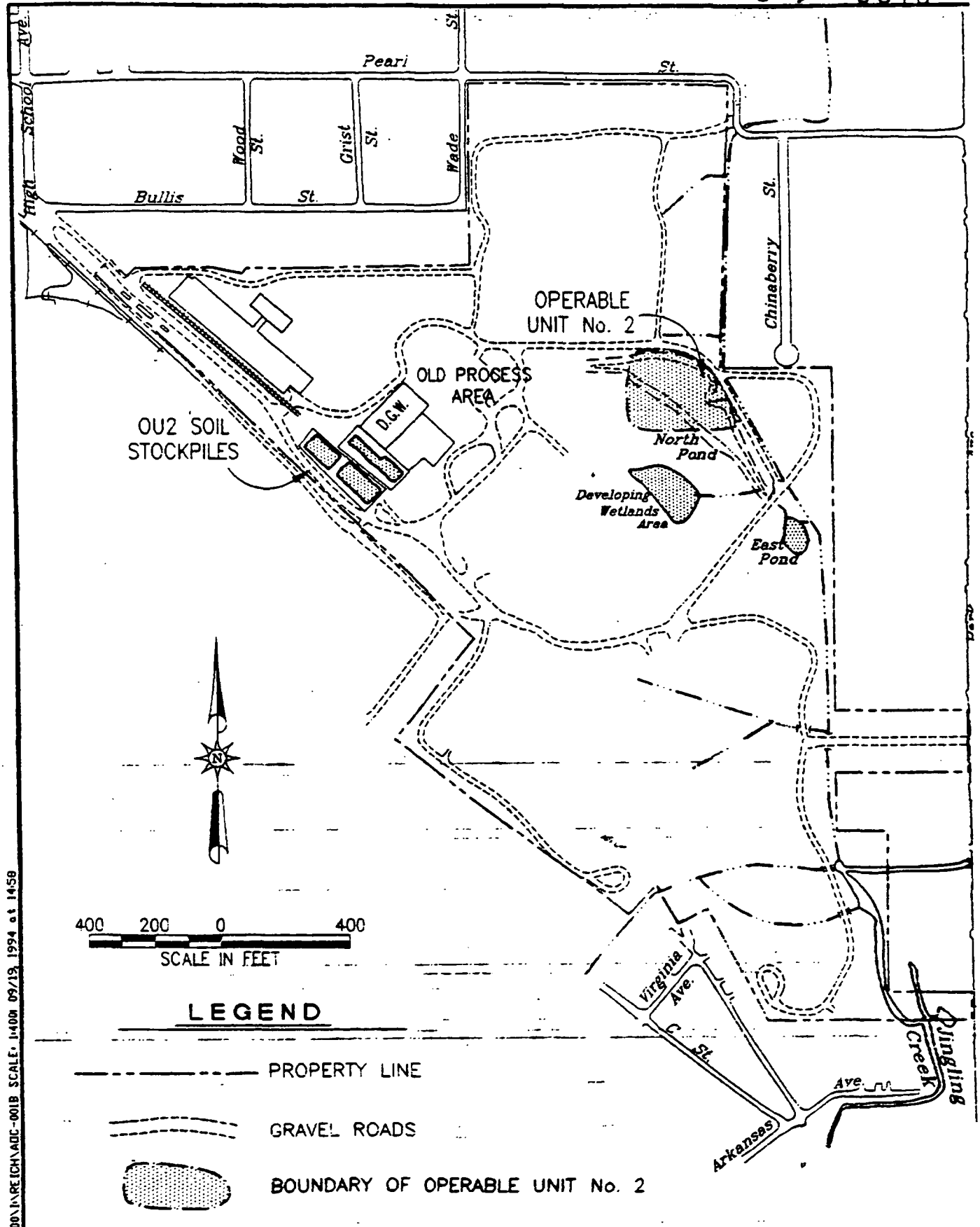
MALCOLM PIRNIE

SITE LOCATION MAP
NEWSOM BROTHERS SITE
COLUMBIA, MISSISSIPPI

MALCOLM PIRNIE, INC

FIGURE 1



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MALCOLM PIRNIE

SITE LAYOUT MAP
OPERABLE UNIT NUMBER 2
NEWSOM BROTHERS SITE
COLUMBIA, MISSISSIPPI

MALCOLM PIRNIE, IN

FIGURE 2

In January 1975, Reichhold Chemicals, Inc., (Reichhold) purchased the property. Reichhold's operation included mixing pentachlorophenol (PCP) with diesel oil. The PCP and diesel oil were mixed and heated using Dowtherm as a heat transfer medium. In other operations, boron trifluoride was mixed with phenol and di-isobutylene to form octal phenol resin. Xylenes were also used in a number of processes.

Reichhold continued operations at the property until March 1977, when an explosion and fire in one of the boiler units destroyed most of the processing facility. No operations were conducted at the Site from 1977 to 1980. During this time the Site was secured behind a locked gate.

In 1980 and 1981, ownership of the 81-acre Site transferred to R.R. Newsom, Sr. and R.R. Newsom, Jr. (owners of New-Cros Construction Company) and Mr. William Earl Stogner (owner of Stogner Trucking Company). The Newsoms' owned 49 acres of the original 81 acres and Mr. Stogner owned the remaining 32 acres. Both Stogner and the Newsoms had buildings on the property from which they operated their respective trucking and construction businesses. In November 1988, Reichhold regained complete ownership of the Site in connection with resolution of legal proceedings brought by Mr. Stogner and the Newsoms.

The Site was listed on the National Priorities List (NPL) in 1986, and an initial Record of Decision was signed on September 18, 1989 (1989 ROD). A detailed history of the Site is presented in the Phase I and Phase II Remedial Investigation Reports dated September 21, 1987, and November 8, 1988, respectively. The Feasibility Study was completed in December of 1988. Remedial activities specified in the 1989 ROD included:

* Removal of asbestos-containing material;
* Removal of above ground and underground storage tanks;
* Excavation of contaminated soils for offsite disposal;
* Excavation of black tar-like waste material (BTM) for off-site thermal destruction and disposal;
* Drainage of on-site ponds, and excavation of contaminated sediments for off-site disposal at an approved facility; and
* Groundwater monitoring and actions to prevent erosion.

The on-site ponds were drained and the contaminated sediments recovered. After the removal action, post-remediation verification sampling (PRVS) confirmed that the upper 1 to 2 feet of soil in the bottom of the ponds had been cleaned to the criteria specified in the 1989 ROD. Reichhold placed clean topsoil on the banks of the ponds and recontoured to prevent erosion. Approximately one foot of clean fill was placed

in the center portion of the ponds to fill in the low areas. Substantial completion of remedial activities under the 1989 ROD was achieved for all areas in September 1993.

In the final stages of remedial activities under the 1989 ROD, potential contamination not previously identified was discovered in the North Pond area. Approximately 3,000 cubic yards of potentially contaminated materials were removed from an area immediately north of the North Pond and stockpiled onsite near the Double Gable Warehouse. During excavation of these materials, suspected contamination extending below the bottom of the pond into the groundwater was observed. In order to address the stockpiled excavated materials and the potential for groundwater contamination at the North Pond, the United States Environmental Protection Agency (USEPA) designated this area as a separate unit, Operable Unit Number 2 (OU2).

The material was sampled along with the OU2 groundwater and assessed for disposal purposes. RCRA characterization of the stockpiled material indicated that it was not a RCRA hazardous waste. In October 1995, these stockpiled materials were removed from the Site and taken to an approved facility for disposal. This action was conducted in the same manner as actions under the 1989 ROD.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Site has always been of interest to the communities surrounding the Site. EPA has been involved directly with the community since the Site's inclusion on the NPL in 1986. Several well-attended public meetings have been conducted for the Site. The community has always had significant input into any action EPA has taken at the Site. At one time the Agency for Toxic Substances and Disease Registry (ATSDR) was actively involved in the Site. However, at the time, the community did not accept the plan ATSDR had assembled. ATSDR ceased involvement at the Site because these differences could not be resolved.

Several community groups have formed to represent concerned citizens over the years. The most recent group is the Jesus People Against Pollution (JPAP). JPAP formed in 1992. JPAP has been an active participant in the Site ever since, and currently is the only active group around the site. JPAP has also been awarded the Technical Assistance Grant (TAG) for the Site. The Pearl River Valley Coalition centered in Southeast Louisiana has shown interest in the Site recently because of concern for impact on the Pearl River. JPAP has been involved in a Public Health Service/EPA project on medical assistance for communities.

For the OU2 Proposed Plan, EPA published full page notices

in the Columbian Progress on May 23 and June 13, 1996. EPA also published notice of the availability of the Proposed Plan and the administrative record and the public meeting in the Hattiesburg American on May 21 and June 16, 1996. About 60 people attended the June 18, 1996, EPA Proposed Plan Public Meeting held at the Columbia High School auditorium. EPA received comments from JPAP on the OU2 Proposed Plan.

4.0 SUMMARY OF SITE CHARACTERISTICS

4.1 SITE GEOLOGY/HYDROGEOLOGY

The Site is located in Marion County, Mississippi, within the Coastal Plain Province, which is a thick blanket of southwestward sloping sediments. In Marion County, these sediments are greater than 30,000 feet thick with a thick deposit of salt near the base of the sediments. Above the salt bed is a varying sequence of sandstones, shales, clays, and limestones that extend upward to the surface.

The Cahaba, Guyton, and Stough soil series are naturally occurring soils which have been identified by the Soil Survey of Marion County, Mississippi (SCS, 1985) to be typical of the Columbia area. These soils are representative of the Pearl River basin. Only the Guyton soil series is present in OU2. The Guyton series is, generally, a poorly drained, silty material, typically found on flood plains and stream terraces.

The stratigraphic sequence in Marion County is divided into (from oldest to youngest) the Catahoula Sandstone, the Hattiesburg Formation, the Pascagoula Formation and the Graham Ferry Formation. These sediments consist of intermittent sand and clay layers and are very difficult to distinguish on the basis of lithologic character; therefore, they have been grouped together as the Miocene aquifer system.

The occurrence of fresh groundwater in Marion County is limited to the upper 150 feet of sediments. The major aquifers in the fresh water zone occur in the Miocene and younger sediments. Groundwater is the sole supply for both industrial and potable water in the Columbia area.

This shallow aquifer system at the Site is an alluvial aquifer. The lithology is composed mostly of fine to medium grained, quartz sands inter-bedded with layers and lenses of clay and gravel. The alluvial deposit is 149 feet thick and underlain by a layer of dense clay of low permeability. The clay appears to be laterally consistent beneath the Site and is believed to confine and protect the underlying Miocene aquifer.

The lithology found in the top twenty feet at OU2 consists of topsoil, fill material, sand and clay. The top layer is approximately four feet thick containing a mixture of topsoil, fill and clay. This layer is underlain by approximately nine feet of a dry, plastic clay, followed by seven to ten feet of a white angular sand. According to gamma ray logs on existing monitoring wells completed on-site as part of OU1, the clay layer at approximately 16 feet below the ground surface is consistent throughout the Site. The permeability test run on the undisturbed clay samples shows a permeability rate of 10^{-9} to 10^{-10} cm/sec, which limits the downward migration of the contaminants into the "deep" alluvial aquifer.

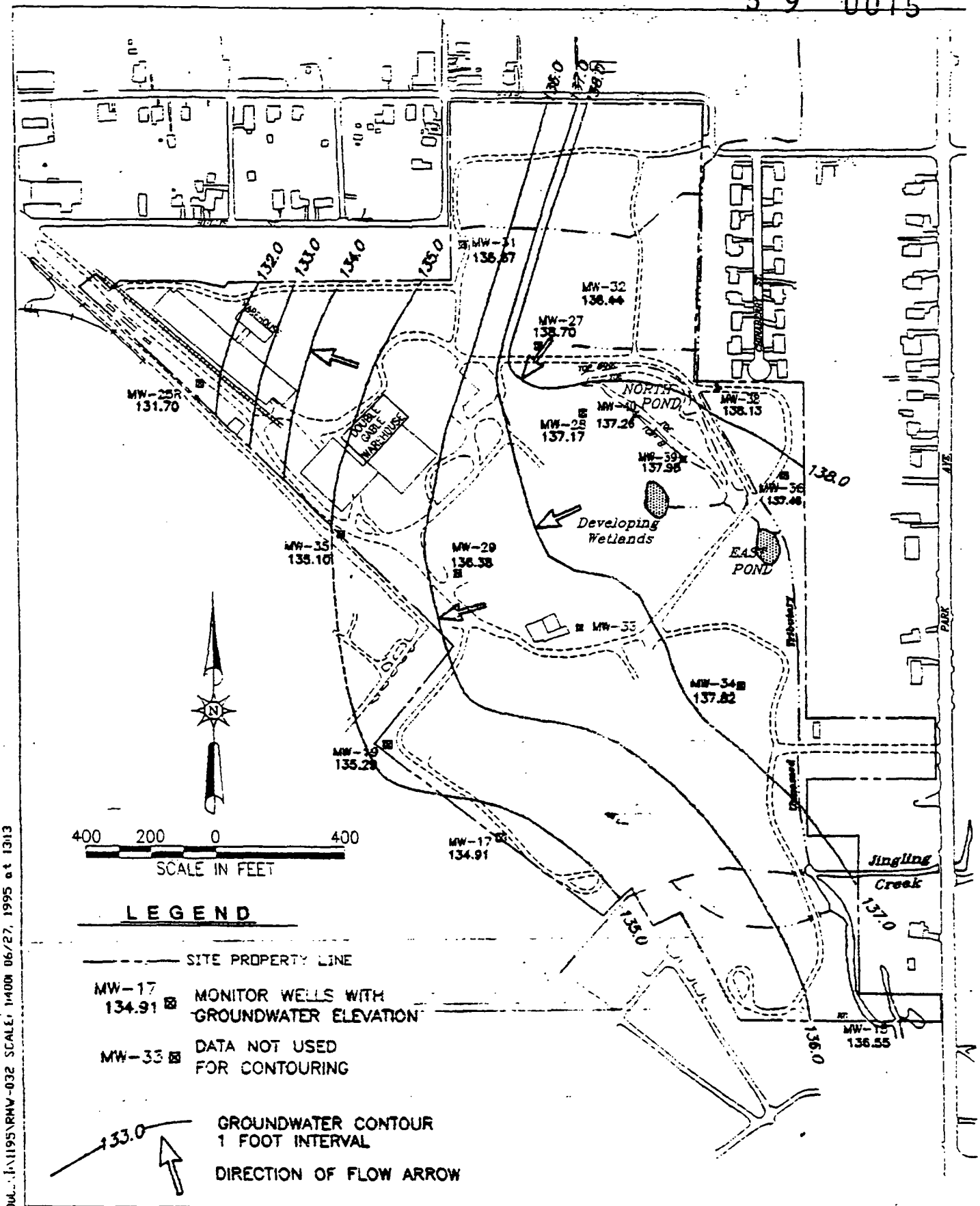
Groundwater flow across the Site is in a west-southwestward direction toward the Pearl River Basin. Water levels were observed across the Site and contoured. Figure 3 illustrates the direction of groundwater flow. The average depth to water ranges between 10 to 15 feet below ground surface (bgs) and fluctuates as much as three feet due to the surficial recharge effects of seasonal precipitation. The shallowest portion of the reworked alluvial deposit contains the shallow saturated zone of OU2. Data collected during remedial activities indicate that the North Pond and other on-site ponds contribute to the direct recharge of the alluvial aquifer at the Site.

4.2 REMEDIAL INVESTIGATION AND GROUNDWATER MONITORING OF OU 2

The Remedial Investigation for OU2 (OU2 RI) was completed in February of 1995. The scope of the OU2 RI was to determine the extent of the groundwater contamination at the Site and to determine if any contaminated soils remained in the North Pond area. The stockpiled soils were also sampled to assist in determining how to address the material. However, the primary focus of the OU2 RI was to determine the extent of the groundwater contamination at the Site.

Soils in the North Pond area and soils stockpiled on-site were sampled during the OU2 RI using field immunoassay testing and test trench sampling. Analysis indicated the presence of both organic and inorganic compounds. However, the concentrations were below action levels established in the 1989 ROD.

Groundwater investigations for OU2 consisted of hydropunch sampling, extraction well sampling and the sampling of monitoring wells MW-28, MW-38, MW-39 and MW-40 (Figure 4). The intent of the hydropunch sampling was to screen the water table and assist in the placement of permanent monitoring wells and an extraction well if necessary. Ten volatile organic compounds (VOCs), 17 semi-volatile organic compounds and 21 inorganic elements were



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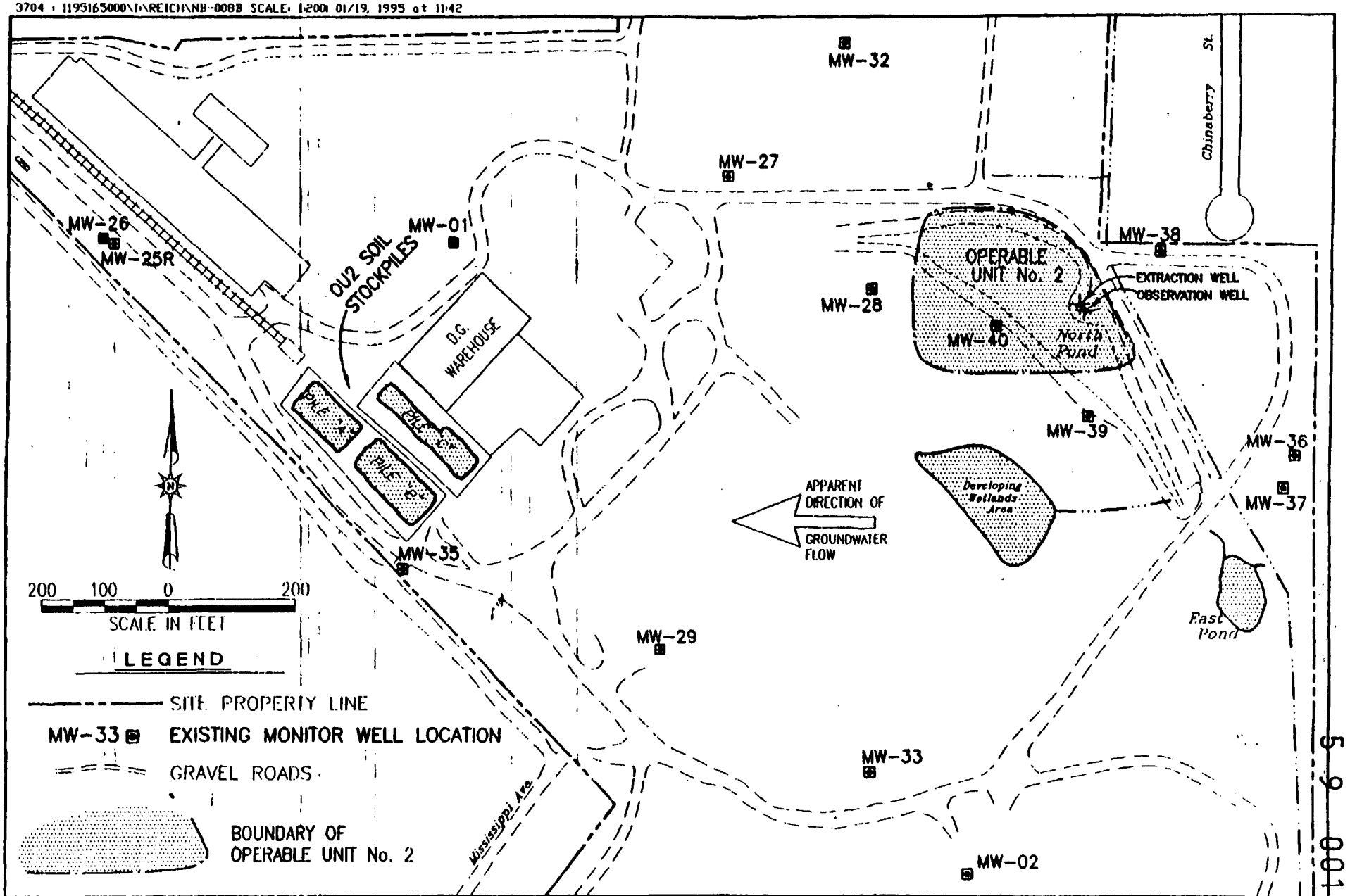
MALCOLM PIRNIE

DIRECTION OF GROUNDWATER FLOW IN SHALLOW ZONE - MAY 7, 1996
NEWSOM BROTHERS SITE
COLUMBIA, MISSISSIPPI

FIGURE 3



MALCOLM PIRNIE

NEWSOM BROTHERS SITE
COLUMBIA, MISSISSIPPI

MONITOR WELL LOCATIONS
OPERABLE UNIT NUMBER 2

FIGURE 4

detected in the groundwater at the Site. Only PCP (60 ppb), naphthalene (10 ppb), ethylbenzene (150 ppb) and total xylene (500 ppb) were detected during the OU2 RI and only the PCP concentration in MW-28 exceeded the Maximum Contaminant Levels (MCLs). However, these substances were detected only in certain wells and only during certain sampling events during the OU2 RI. Therefore, the OU2 RI sampling results do not demonstrate a likely plume of contamination in the North Pond Area. The source of whatever limited contamination that may be present appears to have been the stockpiled soils which were excavated from the North Pond.

Several sampling events have occurred since the completion of the OU2 RI. As part of the groundwater monitoring plan under the 1989 ROD, a network of wells are sampled on a semiannual basis. During the November 1995 sampling event, two of the sampled wells indicated the presence of PCP. These wells were MW-19 (3.2 ug/l) and MW-37 (4 ug/l). Monitoring well 19 is located approximately 1200 feet southwest of the North Pond and monitoring well 37 is located approximately 100 feet southeast of the North Pond. These same wells have been sampled on numerous occasions during the monitoring period. In all other quarterly and semi-annual monitoring events, the sampled wells had concentrations below the MCLs or non detect (See Tables 1 and 2).

To ensure Site conditions were consistent with the OU2 RI, EPA conducted an in house round of monitoring well sampling of six onsite wells including MW-19 and MW-37. The sampling was conducted in March of 1996 and the results did not indicate the presence of PCP or any other organic compounds at significant concentrations. Based on these sample results and this absence of PCP contamination, EPA believes that the analytical results from the November 1995 groundwater monitoring event indicating the presence of PCP were anomalies and do not correctly represent the actual site picture. Results of this sampling event are displayed in Table 3.

5.0 SUMMARY OF SITE RISKS

A Baseline Risk Assessment was conducted by Reichhold with EPA oversight as part of the OU2 RI to estimate the health or environmental threats that could result if no further action were taken at the Site. Results are contained in the Final Baseline Risk Assessment Report and Addendum to the Baseline Risk Assessment. A Baseline Risk Assessment represents an evaluation of the risk posed if no remedial action is taken. The assessment considers environmental media and exposure pathways that could result in unacceptable levels of exposure now or in the foreseeable future. Data collected and analyzed during the OU2 RI provided the basis for the risk evaluation. The risk

TABLE 1
SHALLOW GROUNDWATER ZONE MONITOR WELLS
NOVEMBER 1996 SEMI-ANNUAL SAMPLING EVENT
REICHHOLD CHEMICALS, INC., NEWSOM BROTHERS SITE, COLUMBIA, MISSISSIPPI

	PCP CONCENTRATIONS (µg/l)								
Well ID	February 1994	May 1994	August 1994	November 1994	May 1995	November 1995	March 1996	May 1996	November 1996
GWPS	1	1	1	1	1	1	1	1	1
MW-15	1U	1U, 1U*	1U, 1U, 10U	1U, NA	1U	1U	NA	1U	1U
MW-17	1U, 10U	1U	1U, 10U	1U, NA	1U	1U	20U, NA, 4U	1U	1U
MW-19	1U	1U	1U	1U, 10U	1U	1U, *3.2*, 1U	20U, 1U, 4U	1U	1U
MW-25R	1U	1U	1U	1U	1U	1U	NA	1U	1U
MW-27	1U	1U	NA	NA	NA	NA	NA	NA	NA
MW-29	1U	1U	NA	NA	NA	NA	NA	NA	NA
MW-31	1U	1U	1U	1U, NA	1U	1U, 1U	NA	1U	1U
MW-32	1U	1U, 10U	NA	NA	NA	NA	NA	NA	NA
MW-33	1U	1U	NA	NA	NA	NA	20U, 1U, NA	NA	NA
MW-34	1U	1U	NA	NA	NA	NA	20U, NA, NA	NA	NA
MW-35	1U	1U, 10U	1U	1U, 1U*	1U	1U	NA	1U	1U
MW-36	1U	1U	1U	*1.2*	1U	1U	NA	1U	1U

Review "General Notes".

Bold Italicized values indicate contaminant concentrations were detected above the GWPS.

Results indicated for the November 1995 sampling event for MW-19 represent (1) Reichhold' analysis results; (2) MDEQ split sample result by the GC/MS method; and (3) a second MDEQ sample result by the electron capture/GC method.

TABLE 6 ENDNOTES:

Number of samples analyzed	=	85
Number of "Detects" above CRDL including estimated values	=	7
Number of "Detects" above GWPS	=	3

5 6 0018

TABLE 2
DEEP GROUNDWATER ZONE MONITOR WELLS
NOVEMBER 1996 SEMI-ANNUAL SAMPLING EVENT
REICHHOLD CHEMICALS, INC., NEWSOM BROTHERS SITE, COLUMBIA, MISSISSIPPI

	PCP CONCENTRATIONS (µg/l)								
Well ID	February 1994	May 1994	August 1994	November 1994	May 1995	November 1995	March 1996	May 1996	November 1996
GWPS	1	1	1	1	1	1	1	1	1
MW-01	1U, 10U	1U	NA	NA	NA	NA	NA	NA	NA
MW-02	1U	1U	NA	NA	NA	NA	20U, NA, NA	NA	NA
MW-16	1U, 1U*	1U	1U	1U	1U	1U	NA	1U	NA
MW-18	1U	1U	1U	1U	1U	1U	NA	1U	1U
MW-20	1U	1U, 1U*	1U, 1U*	1U	1U	1U	NA	1U	1U
MW-26	1U	1U	1U	1U, 1U, 1U	1U	1U	NA	1U	1U
MW-30	1U	1U	NA	NA	NA	NA	NA	NA	NA
MW-37	1U, 1U*	1U, 1U*	1U	1U	1U	4, 1U, 1U	20U, 1U, NA	1U	1U

eview "General Notes".

old italicized values indicate contaminant concentrations were detected above the GWPS.

esults indicated for the November 1995 sampling event for MW-37 represent (1) Reic[illegible] in-house results; (2) MDEQ split sample result by the GC/MS method; nd (3) a second MDEQ sample result by the electron capture/GC method.

ABLE 16 ENDNOTES:

umber of samples analyzed	=	58
umber of "Detects" above CRDL including estimated values	=	1
umber of "Detects" above GWPS	=	1

TABLE 3
NEWSOM BROTHERS
ANALYTICAL DATA SUMMARY
MARCH 12, 1996

5 9 0020

INORGANIC ELEMENT	MW-02 µg/l	MW-17S µg/l	MW-19 µg/l	MW-33 µg/l	MW-34 µg/l	MW-37 µg/l
Aluminum	3,800	530	1,900	260	3,400	940
Barium	75	380	110	110	80	31
Cobalt	--	9.9	--	--	--	--
Chromium	23	14	12	--	10	--
Copper	--	--	9.6	--	--	--
Manganese	59	2,700	930	970	400	11
Strontium	26	210	99	220	52	23
Titanium	37	23	15	--	24	13
Vanadium	--	49	12	--	7.6	--
Yttrium	6.6	44	30	--	7.5	--
Zinc	14	35	27	--	11	--

PURGEABLE ORGANICS	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Toluene		12A	--	--	6.1	--

MISCELLANEOUS PURGEABLE ORGANICS	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Isopropylbenzene	--	0.78AJ	--	--	--	--
P-Isopropyltoluene	--	0.78AJ	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	1.2	--
Unidentified Terpene	--	200JN	--	--	--	--
Pentachlorophenol	--	--	--	--	--	--

Footnotes:
-- - Element analyzed for but not detected
A - Averaged Value
J - Estimated Value
N - Presumptive Evidence of presence of material

assessment process can be divided into four components: contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

5.1 CONTAMINANTS OF CONCERN

The objective of contaminant identification is to screen the information that is available on hazardous substances present at the Site and to identify contaminants of concern (COCs) in order to focus subsequent efforts in the risk assessment process. COCs are selected based upon their toxicological properties, concentrations and frequency of occurrence at the Site.

The EPA required Reichhold to select chemicals of potential concern (COPC) using the following two criteria:

1. Screen the maximum concentrations of chemicals in all media against risk based values derived from Region 3's Risk Based Screening Tables by using a cancer risk of 10^{-6} and a hazard quotient of 1.0. Select chemicals which exceed these values.

2. Compare the inorganic chemicals to a value of two times the average background concentrations for that chemical.

Using these two criteria, the list of Chemicals of Potential Concern was reduced to the following chemicals:

SUBSURFACE SOIL

Semi Volatiles:
2-Methylnaphthalene
Pentachlorophenol
Phenanthrene

GROUNDWATER

Volatiles:
Benzene
Ethylbenzene
Xylenes (total)

Semi Volatiles:
2-Methylnaphthalene
Pentachlorophenol
Phenanthrene

Inorganics:
Arsenic
Manganese

5.2 EXPOSURE ASSESSMENT

An exposure assessment was conducted to estimate the magnitude of exposure to the contaminants of concern at the Site and the pathways through which these exposures could occur. The results of this exposure assessment are combined with chemical-specific toxicity information to characterize potential risks.

Groundwater and soil provide the only potential pathways. Scenarios were developed for human exposure to the soil and groundwater. These scenarios included possible current routes of exposure and potential future routes of exposure.

At the time of the Baseline Risk Assessment, the stockpiled soils on-site had not been removed. However, in October of 1995, these soils were removed from the Site. This action has a significant impact on the Exposure Assessment. Since the stockpiled soil was the only potential threat in the current scenario, the entire current scenario is eliminated. The future scenario includes only the potential effects caused by the uncontrolled groundwater migration to off-site residential wells located downgradient from the Site. Any future on-site exposure pathway is incomplete because there are no receptors. The Site is wholly owned by Reichhold and its access is restricted. All onsite water is supplied by the City of Columbia water system. A summary of the potential future exposure pathways is included as Table 4.

No municipal or private drinking water wells are located offsite in the direction of the groundwater migration at the Site. If groundwater continued to migrate in the current south/southwestern direction, and crossed the Site boundary, it would seep into the Pearl River before contacting any water supply wells. The entire area is serviced and supplied by the City of Columbia municipal water system. Also, the installation of a private well is not economically viable due to the availability of city water, the well installation costs and the additional costs of maintaining a well completed in an aquifer containing elevated concentrations of naturally occurring calcium, iron, manganese and sodium.

This scenario was included in the baseline risk assessment as a theoretical exercise to meet EPA requirements and would only be realistic if additional water supply wells were reasonably expected to be established offsite in the direction of groundwater flow. As discussed in the preceding paragraphs, sampling does not confirm the existence of any plume of contamination and the likelihood of additional potable water supply wells being established in the area of the Site is very low. Therefore, future off-site groundwater is not a complete pathway and no complete pathways exist at this Site.

5.3 TOXICITY ASSESSMENT

The purpose of a toxicity assessment is to weigh available evidence regarding the potential of the contaminants of concern to cause adverse effects in exposed individuals and to provide an estimate of the relationship between the extent of exposure and

TABLE 4
SUMMARY OF POTENTIAL FUTURE EXPOSURE PATHWAYS

Potentially Exposed Population	Exposure Routes, Medium and Exposure Point	Reason for Selection
OFF-SITE RESIDENTS	Ingestion of groundwater from wells located downgradient from site.	Wells could be located within contaminated area in the future if contaminated groundwater migrates off-site.
	Dermal contact with groundwater from wells located downgradient from site.	Wells could be located within contaminated area in the future if contaminated groundwater migrates off-site.
	Inhalation of chemicals volatilized from groundwater during home use.	Wells could be located within contaminated area in the future if contaminated groundwater migrates off-site.

the likelihood of adverse effects. The toxicity assessment is based on toxicity values which have been derived from quantitative dose-response information. Toxicity values for cancer are known as slope factors (SFs) and those determined for noncarcinogenic effects are referred to as reference doses (RfDs).

Slope factors (SFs), which are also known as cancer potency factors (CPFs), have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper-bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. SFs are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied. Cancer slope factors for the potential contaminants of concern may be found in Tables 4-5 and 4-6 of the Baseline Risk Assessment.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g. the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g. to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur. Reference doses for the potential contaminants of concern may be found in Tables 4-1 and 4-2 of the Baseline Risk Assessment.

5.4 RISK CHARACTERIZATION

In this final stage of the risk assessment, the results of the exposure and toxicity assessments are combined to provide numerical estimates of the carcinogenic and non-carcinogenic risks for the Site. In order to characterize potential noncarcinogenic effects, estimated intake levels are compared with toxicity values. Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the Hazard Quotient (HQ) (or the ratio of the estimated intake

derived from the contaminant concentration in a given medium to the contaminant's reference dose). A HQ exceeding unity (1.0) indicates a potential for Site-related noncarcinogenic health effects. By adding the HQs for all contaminants within a medium or across all media to which a given population may be reasonably exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The total hazard indices would exceed 1.0 for the future off-site resident scenario exposure to groundwater for both adults and children if a complete pathway existed. The HI for the adult scenario would be 1.73E+1 and the HI for the child scenario would be 3.32E+1 if a complete pathway existed.

The primary contaminants driving these values were Arsenic and Manganese. Arsenic was detected at levels below the MCL onsite and both Arsenic and Manganese are elements which are naturally occurring at elevated levels in the Columbia area. Furthermore, Manganese is not related to past site activities and manufacturing processes. Without these two contaminants the HI for the adult scenario is below 1.0 and the HI for the Child Scenario is below 3.0.

Excess lifetime cancer risks are determined by multiplying the intake level with the slope factor. These risks are probabilities that are generally expressed in scientific notation (e.g. $1x10^{-6}$ or 1E-6). An excess lifetime cancer risk of 1E-6 indicates that, as a plausible upper bound, an individual has a one in a million chance of developing cancer, over a 70 year lifetime, as a result of site-related exposure to a carcinogen. The NCP states that sites should be remediated to chemical concentrations that correspond to an upper-bound lifetime cancer risk to an individual not exceeding 10^{-6} to 10^{-4} excess lifetime risk. Carcinogenic risk levels that exceed this range indicate the need for performing remedial action at a site.

COPES that contributed significantly to pathways with cancer risks that exceed $1x10^{-4}$ (1E-4) were selected as chemicals of concern (COCs). Assuming that a complete future off-site pathway existed, both the Off-Site Adult Resident Exposure Cancer Risk Scenario and the Off-Site Child Resident Cancer Risk Scenario would have cancer risk levels below 8.5E-4. In both cases the only element of concern would be Arsenic which was found below the MCL onsite and is a naturally-occurring element found at elevated levels in the Columbia area.

6.0 ENVIRONMENTAL ASSESSMENT (EA)

The environmental assessment (EA), also known as the ecological assessment, is a "qualitative and/or quantitative appraisal of the actual or potential effects of a hazardous waste site on plants and animals other than people and domesticated species." Environmental receptors that are expected to inhabit the study area were identified during the OU2 RI.

The dominant vegetation type in the site area is southern pinelands, typified by longleaf, loblolly, shortleaf and slash pines intermixed with oaks and hickories. An ecological investigation conducted in 1991 identified that the Site, in general, is the home of wildlife usually found in woodlands, riverbanks and swamps. A variety of animals and vegetation were found to inhabit the Site. Among these were approximately 50 species of birds, fish, reptiles and amphibians, many types of insects, and a variety of vegetation. Two species classified by the state as threatened and by the Federal government as endangered are known to occur in Marion County (CDM 1989). These are the ringed sawback turtle (Graptemys oculifera) and the gopher tortoise (Gopherus polyphemus). No sightings of these species have been reported at the Site.

The constituents of potential concern for subsurface soil are: ethylbenzene, total xylenes, pentachlorophenol, aluminum and iron. Although these constituents exceeded toxicity values for laboratory species, the potential risk from their presence in subsurface soil is negligible. The North Pond area does not represent quality habitat for terrestrial species, and since the pond collects water following rain events, it is very unlikely that terrestrial wildlife would burrow into the soils at the bottom of the pond. Therefore, concentrations of contaminants in the subsurface soils of the North Pond do not represent a significant risk to the ecology of the area.

7.0 DESCRIPTION OF ALTERNATIVES

Because no complete groundwater pathway exists, no remedial action is necessary for OU2. For comparison, purposes, however, a No Action Alternative and a No Action with Monitoring Alternative are described in this ROD and analyzed under the criteria used to select remedies.

7.1 Alternative No. 1 - No Action

The No Action alternative is carried through the screening process as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This alternative is used as a baseline for comparison with other alternatives that are

developed. Under this alternative, EPA would take no further action at the Site. There is no cost associated with this alternative since no additional activities would be conducted.

7.2 Alternative No. 2 - No Action With Monitoring

To ensure that possible contaminants will not pose a threat to off-site residents at the Site, a monitoring well system will be established at the site. The five well system will operate for a three year period. The cost of this alternative is $194,200.

8.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

This section of the ROD provides the basis for determining which alternative provides the best balance with respect to the statutory balancing criteria in Section 121 of CERCLA and in Section 300.430 of the NCP. The remedial alternatives selected were evaluated using the following nine evaluation criteria:

* Overall protection of human health and the environment.
* Compliance with applicable and/or relevant Federal or State public health or environmental standards.
* Long-term effectiveness and permanence.
* Reduction of toxicity, mobility, or volume of hazardous substances or contaminants.
* Short-term effectiveness, or the impacts a remedy might have on the community, workers, or the environment during the course of implementing it.
* Implementability, that is, the administrative or technical capacity to carry out the alternative.
* Cost-effectiveness considering costs for construction, operation and maintenance of the alternative over the life of the project, including additional costs should it fail.
* Acceptance by the State.
* Acceptance by the Community.

The NCP categorizes the nine criteria into three groups:

(1) Threshold Criteria - overall protection of human health and the environment and compliance with ARARs are threshold

criteria that must be satisfied in order for an alternative to be eligible for selection;

(2) Primary Balancing Criteria - long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; short-term effectiveness; Implementability, and cost are primary balancing factors used to weigh major trade-offs among alternative hazardous waste management strategies; and

(3) Modifying Criteria - state and community acceptance are modifying criteria that are formally taken into account after public comment is received on the proposed plan and incorporated in the ROD.

The selected alternative must meet the threshold criteria and comply with all ARARs or be granted a waiver for compliance with ARARs. Any alternative that does not satisfy both of these requirements is not eligible for selection. The Primary Balancing Criteria are the technical criteria upon which the detailed analysis is primarily based. The final two criteria, known as Modifying Criteria, assess the public's and the state agency's acceptance of the alternative. Based on these final two criteria, EPA may modify aspects of a specific alternative.

The following analysis is a summary of the evaluation of OU2 alternatives under each of the criteria. A comparison is made between each of the alternatives for achievement of a specific criterion.

Threshold Criteria

8.1 Overall Protection of Human Health and the Environment

Because no complete pathway exists, both the No Action Alternative and the No Action with Monitoring Alternative are protective of human health and the environment. The No Action with Monitoring alternative provides additional sampling analysis to ensure that there is no threat posed at the Site.

8.2 Compliance with ARARs

Both the No Action Alternative and the No Action with Monitoring Alternative will comply with Applicable Relevant and Appropriate Regulations (ARARs). As described in Section 4.2, PCP was the only compound detected in groundwater at concentrations exceeding the MCL. In both cases, additional sampling of the PCP contaminated wells resulted in repeated non-detect results. Therefore, the MCLS are not exceeded in the current Site conditions. The No Action with Monitoring Alternative will ensure that PCP concentrations do not exceed the MCLS in the future.

Primary Balancing Criteria

8.3 Long-Term Effectiveness and Permanence

Neither Alternative provides improvement to the Site conditions other than natural reduction in contaminant levels. The primary advantage of the No Action with Monitoring Alternative is the ability to monitor any change in on-site conditions.

8.4 Toxicity/Mobility/Volume Reduction

Neither alternative would reduce the toxicity, mobility or volume of on-site contaminants other than reductions attributable to natural degradation.

8.5 Short-term Effectiveness

The No Action Alternative will have no effect on the Site conditions in the short-term. The No Action with Monitoring Alternative will also have no effect on the Site in the short-term other than identifying any changes to Site conditions.

8.6 Implementability

Nothing is required to implement the No Action Alternative. The No Action with Monitoring Alternative will require the placement of one additional monitoring well and periodic sampling of a monitoring well system consisting of five wells. All aspects of this alternative are easily accomplished using existing and proven technology.

8.7 Cost

The No Action Alternative will not have any cost associated with it. The cost of the No Action with Monitoring Alternative is estimated at $194,200.

Modifying Criteria

8.8 State Acceptance

The State of Mississippi, as represented by the Mississippi Department of Environmental Quality (MDEQ), has assisted in the Superfund process through the review of documents and submittal of comments. The State has reviewed the proposed plan and attended the public meeting and concurs with the requirement for further monitoring.

8.9 Community Acceptance

Based on the comments expressed at the June 18, 1996 Public Meeting and in the ensuing comment period, the seems more concerned about Operable Unit 1 and the possible soil contamination in their neighborhood. EPA received few comments related to OU2. However, some members of the community do not believe the Site has been or can be cleaned to a safe level. One group from outside the community had concerns about site impact on the Pearl River.

9.0 Monitoring Plan

Although no complete pathway exists and no remedial action is necessary, EPA believes that additional groundwater monitoring is appropriate. The proposed groundwater monitoring plan will consist of five groundwater monitoring wells (MW). Four of the wells are already in place at the Site. The four existing monitor wells are MW-28, MW-38, MW-39 and MW-40. The fifth well will be installed down gradient to MW-28 prior to implementing the proposed monitoring program. The fifth monitoring well will be identified as MW-41 as shown on Figure 5. Monitor well MW-41 will be developed one time, 30 days prior to initial monitoring, to remove any accumulated silt and to ensure that a representative sample may be collected. A designated bladder pump will be installed in the well to sample groundwater.

The monitoring program will be conducted over a period of three years as follows:

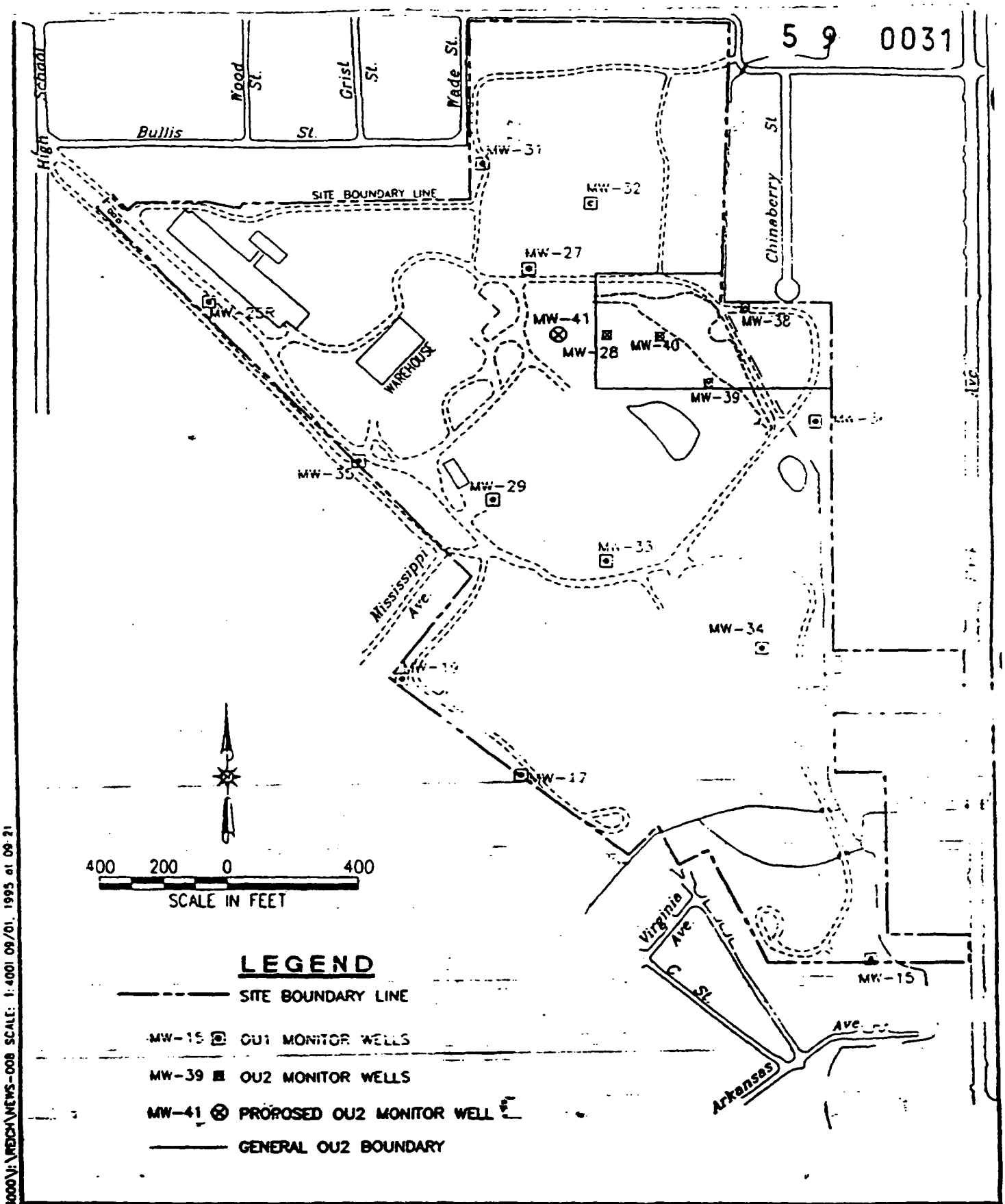
* Year 1 Quarterly Sampling
* Year 2 Semi-Annual Sampling
* Year 3 Semi-Annual Sampling

All five wells will be monitored during the three year monitoring period. Groundwater samples collected during the monitoring period will be field tested for pH, conductivity and temperature. Samples collected will be submitted to an off-site laboratory for analysis according to CLP protocols.

Sample analysis will take approximately four weeks after sample collection is completed. A report of the sample analysis results will be prepared for each sampling period and will be submitted within 45 days of the receipt of analytical results.

10.0 Explanation of Significant Changes

There are no significant changes between the proposed plan and this ROD.



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MALCOLM PIRNIE

GROUNDWATER MONITOR WELL LOCATIONS IN THE SHALLOW ZONE NEWSOM BROTHERS SITE COLUMBIA, MISSISSIPPI

FIGURE 5

RESPONSIVENESS SUMMARY

Newsom Brothers Site
Columbia, Marion County, Mississippi

EPA held a public meeting on June 18, 1996 in Columbia, Mississippi, to present the proposed remedy to the community and provide the community with an opportunity to comment on the proposed remedy. In accordance with the NCP, a 30 day comment period was provided for written correspondence to be submitted to EPA. This 30 day comment period was extended by an additional 30 days. This period officially ended on July 23, 1996.

In this responsiveness summary, EPA will respond to significant comments raised during the public comment period related to OU2. Other comments made during the public comment period will be addressed by the Remedial Project Manager in separate communications with those individuals who commented.

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1. Why are poison signs not posted along perimeter of OU2 until observations show the Site is safe?

1. OU2 is located within the larger boundaries of the entire Site. The entire facility is fenced with signs posted stating that the facility is an EPA Superfund site. In addition to the fencing around the entire Site, OU2 is completely fenced.

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2. Is the actual source of the groundwater contamination known and has it been removed from the site?

2. According to past EPA studies, the source of the groundwater contamination at the North Pond is the previously excavated drums and sediments located in the North Pond area. Those materials have been removed from the site. The monitoring required as part of this remedy should confirm that the source is gone.

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3. What about benzene, toluene, ethylbenzene and PCP exceeding the MCLS in on-site groundwater sampling?

3. These contaminants were found in groundwater samples collected from the North Pond area via immunoassay, hydropunch or monitoring well samples. However, an actual plume was never identified and recent groundwater monitoring has indicated a lack of contamination at the site.

Nevertheless, a monitoring program will be established as part of the remedy for OU2 which will continue to ensure that what contamination remains under the North Pond is not spreading off-site.

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4. Is the proposed remedy adequately protective of public health in and around the Site?

4. Yes, the Baseline Risk Assessment used a protective approach by acknowledging the fact that the low levels of contaminants still present onsite are located exclusively beneath the North Pond. The findings of the risk assessment indicate that the only threat posed by groundwater is the potential off-site migration into a potable water supply. As discussed earlier, this is unrealistic given the site conditions and the City supply of potable water in the area. Hence, this pathway is not complete. Nevertheless, a monitoring program will be initiated under the OU2 ROD which will provide EPA with knowledge of any movement of contaminants so EPA can require that the proper steps be taken at that time. Therefore, it is protective of human health and the environment.

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5. Can or will EPA relocate people due to the Site?

5. The groundwater contamination associated with operable unit two has been found only on the site and residents in the area are served by municipal wells completed in a deep confined aquifer. The municipal well locations are upgradient from the site. Therefore, this does not pose a threat to residents around the site.

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6. Have any contaminants from the Site reached the Pearl River?

6. As part of OU1, the tributaries (Jingling Creek) were sampled to ensure contaminants were not reaching the Pearl River. No contaminants were detected in those bodies of water. Contaminated groundwater from OU2 does not pose a threat to the Pearl River or it's tributaries because it is confined and seems to be decreasing.

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7. Can groundwater contamination from the North Pond area possibly get into the municipal water supply lines?

7. Water pressure within municipal water lines is usually very high due to the amount of pressure required to move the water to all distribution points served by the system. When a leak occurs, water from inside the line will escape the system; however, due to the water pressure, it is very unlikely to impossible for groundwater to actually enter the lines. Also, water supply lines are not located under the North Pond area.

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8. Can you clean the Site up?

8. Based on the findings of the Remedial Investigation and the Baseline Risk Assessment, an actual groundwater plume does not exist at the site. Also, the limited contaminants located beneath the North Pond do not pose a significant threat in their present location. EPA will conduct groundwater monitoring to determine whether the contaminants are moving to an area where they may pose a threat in the future.

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9. Would you use the same remedies (no action, and no action with monitoring) if this Site was surrounded by an affluent white community?

9. Yes, because there is little room for bias in the decision process. The data from the Baseline Risk Assessment and OU2 RI indicate the Site does not pose a threat to the surrounding communities. These values do not factor income, gender, religion race or ethnic group. However, separate calculations are done for children and adult populations.

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10. What is going on at the Site now?

10. The only activity ongoing at the site is the groundwater monitoring for OU1. All planned removal of contaminated material was completed in October of 1995.

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11. Is EPA sure the groundwater under the North Pond is not migrating offsite and affecting the community?

11. At this time, the groundwater contamination is not migrating off-site. EPA will conduct groundwater monitoring to ensure groundwater does not migrate off-site for three years.

In addition to questions and concerns raised during the June 1996 public meeting, JPAP submitted a technical document prepared with the assistance of the JPAP technical assistance consultants. The document discusses JPAP's concerns at the Site and raises issues to be addressed by EPA. In the following paragraphs EPA will respond to those questions related to OU2.

OU2 SITE CHARACTERIZATION

JPAP - Disproportionate Focus on Compliance with MILS - One of the nine evaluation criteria was allocated a disproportionate weight of consideration during OU2 investigations (compliance with ARARs). The goal to characterize the extent of migration of Site-related contaminants is equally important. The focus of the investigation was more on deep groundwater contaminant levels as opposed to contaminant migratory patterns. This resulted in the over emphasis of ARARs such as Drinking Water Standards (MILS).

EPA - During the OU2 RI, EPA focused most of the sampling activity at what was and is believed to be the source and extent of groundwater contamination, the North Pond area. EPA used four different sampling techniques 1) hydropunch, 2) test trench, 3) monitoring wells, and 4) immunoassay. Therefore, EPA believes it thoroughly sampled the groundwater under and down gradient of the North Pond. The depths of sampling ranged from the surface to approximately 25 feet below the surface. EPA believes that contaminant levels found in these samples are the highest levels found at the Site. This thorough sampling protocol was not in any way curtailed because of any ARARs analysis.

JPAP - Direction of flow and depths of contaminant plumes - The OU2 RI was based on an assumption from OUR activities that a downward, vertical migration of contaminant plumes was the only significant direction of flow to consider.

EPA - Numerous studies and analysis have been conducted throughout the years of remedial activity at the Site to determine the direction of groundwater flow. These studies indicate that the horizontal groundwater flow direction in the shallow aquifer beneath the site is South/Southwest toward the Pearl River.

JPAP - Test trench sampling results - Test trench sampling were not analyzed for Site-related contaminants.

EPA - The purpose of the test trench sampling was to provide a visual of horizontal movement of non-hazardous waxing material. Hydropunch, immunoassay, and monitoring well samples were used to provide analytical data.

JPAP - Hydropunch Sampling Results - EPA failed to determine the extent of groundwater contamination with the Hydropunch sampling during the RI. The sampling was completed in the area with high levels of contamination. Therefore a clean boundary was never established.

EPA - EPA agrees with comments regarding the placement of Hydropunch sample locations. These samples were collected from the North Pond Area and indicate that contaminants are located in the shallow groundwater beneath the Site. However, the primary means of determining the extent of contamination at the Site is via the monitoring wells. The monitor wells at the Site completely surround the OU2 area and are designed to identify any horizontal movement of groundwater contaminants. As part of the monitoring plan for OU2, an additional well (MW-41) will be installed directly southwest of the North Pond area.

PROBLEMS WITH SAMPLE COLLECTION, ANALYSIS AND INTERPRETATION

JPAP - Pentachlorophenol (PCP) - Three significant problems have characterized the analyses and reporting of PCP throughout the remedial process. These include: (1) inconsistency in analytical methods used, (2) SQLs exceed MILS, and (3) Poor recoveries of PCP leading to routine underestimations of actual concentrations.

EPA - During all sampling events at the Site, current and approved EPA methods for all analysis were used. EPA also approved Quality Assurance and Quality Control (QA/QC) samples at the Site. For PCP analysis, Reichhold used Method 8150 *modified which has been approved by EPA for PCP analysis in order to detect concentrations at levels at the M.C.L..

JPAP - Arsenic - The Site standard for arsenic is 50 ug/l. Some samples have quantitation limits as high as 80 ug/l. Also the health-based water quality criteria of 0.02 ug/l is more appropriate for the Site.

EPA - EPA uses MILS for cleanup standards when they exist. Therefore the standard for arsenic in groundwater is 50 ug/l. This was selected because it is EPA's national M.C.L. for arsenic. The state of Mississippi also uses 50 ug/l as the M.C.L. for arsenic in drinking water. The arsenic water standard of 0.002 ug/l in water is a Health Based Standard for Arsenic in surface water and does not apply to groundwater contamination levels associated with OU2 of the Site.

JPAP - Dioxin - Dioxin contamination levels determined as part of OUR probably inaccurately characterized extent of Dioxin at the site. Therefore, Dioxin analysis should have been included as part of OU2.

EPA - Dioxin was never sampled for as part of the RI for OU2 due to its absence from the overall Site in previous sampling activities (RI OUR). During the RI for OUR, EPA sampled some of the most likely areas of the Site where dioxin contamination might exist. Results were mostly negative with only trace levels present on-site. All areas of the Site where even trace levels of dioxins were detected have since been removed and disposed of properly. Therefore, EPA had no basis for requiring dioxin sampling in the OU2 investigation.

OU2 RISK ASSESSMENT

The concerns raised in this paragraph were also raised in the preceding paragraphs and have already been addressed.

PROPOSED OU2 REMEDIAL PLAN

JPAP - Monitoring Strategy Plan - Inadequate detail was provided on the monitoring strategy plan including who will collect the samples, what analytes will be tested for and how many samples will be collected during what quarters and from what wells?

EPA - The monitoring strategy plan will consist of quarterly monitoring during the first year and semi-annual monitoring during the second and third years. Five monitoring wells will be sampled during each sampling event. These will include existing Monitoring wells MW-28, MW-38, MW-39 and MW-40 and will also include the newly installed monitoring well MW-41. MW-41 will be installed south/southwest of the North Pond area. EPA will offer the chance to Reichhold to conduct this sampling. If Reich old declines to conduct this sampling, EPA will do it. This monitoring will be conducted as part of the remedy for OU2.

JPAP - Chemical Attenuation and Biodegradation - A three year monitoring plan is not adequate to ensure that chemical attenuation and biodegradation continues with time.

EPA - The purpose of the groundwater monitoring is to affirm that no definable contaminant plume exists at the site or migrating off-site; the purpose is not designed to monitor chemical attenuation and biodegradation with time. The three-year period of monitoring is sufficient to determine if any plume actually exists and will migrate off-site.