5 9 0001

Site:
Break: 5.9
Other:

8747

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location:

B&B Chemical Site - Hialeah, Dade County, Florida

Statement of Basis and Purpose:

This decision document presents the selected remedial action for the B&B Chemical Superfund Site in Hialeah, Dade County, Florida, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), March 8, 1990. The selection of the remedial action presented in this document is based on the administrative record for the B&B Chemical Site.

The State of Florida, as represented by the Florida Department of Environmental Protection (FDEP), has been the support agency during the development of the remedial investigation/feasibility study (RI/FS). In accordance with 40 CFR 300.430, as the support agency, FDEP has provided input during the RI/FS process. Based upon comments received from FDEP, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not been received.

Assessment of the Site:

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the 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:

It is EPA's judgment that the selected remedy will address the principal threats posed by the environmental conditions at this site.

The major components of the selected remedy include:

- o Natural attenuation;
- o Groundwater monitoring in order to verify the achievement of the maximum contaminant levels (MCLs) and;
- o Institutional controls.

Statutory Determination:

The selected remedy is protective of human health and the environment, complies with federal and State of Florida requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technology to the maximum extent practicable at the site. Based on the limited area of low-level groundwater contaminants present at the site and the fact that these concentrations, relative to drinking water standards, are low, EPA concluded that it is currently impracticable to treat the groundwater effectively. Thus, this remedy does not satisfy the statutory preference for treatment as a principal element.

This remedy will serve to mitigate the threat to human health through the natural attenuation of hazardous substances released from the site. Because this remedy will result in hazardous substances remaining onsite, a review of the remedial action will be conducted within five years after the initiation of the remedy to ensure that the remedy continues to provide adequate protection to human health and the environment. The review will be performed every five years thereafter until health-based levels are achieved.

EPA has determined that its response at this site is complete since no construction is required. The only remedial activity remaining at the site is groundwater monitoring and institutional controls. Therefore, the site now qualifies for inclusion on the Construction Completion List.

September 12, 1994

DATE

Patrick M Tobin for

John H. Hankinson, Jr.
Regional Administrator

5 9 0003

RECORD OF DECISION

B&B CHEMICAL SUPERFUND SITE

HIALEAH, FLORIDA

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

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B & B CHEMICAL

1.0 SITE LOCATION AND DESCRIPTION

The B&B Chemical Superfund Site (the B&B Site or the site), is a four and a half acre site, located at 875 West 20th Street, Hialeah, Dade County, Florida, in an area of dense light industry. The site is bounded by West 20th Street to the south, West 8th Avenue to the east, Florida East Coast Railroad track and West 21st Street to the north, and to the west by the Dade County Metrorail Okeechobee Station and parking garage (Figure 1). The northwest/southeast trending Miami Canal is located within 800 feet of the southwestern corner of the site.

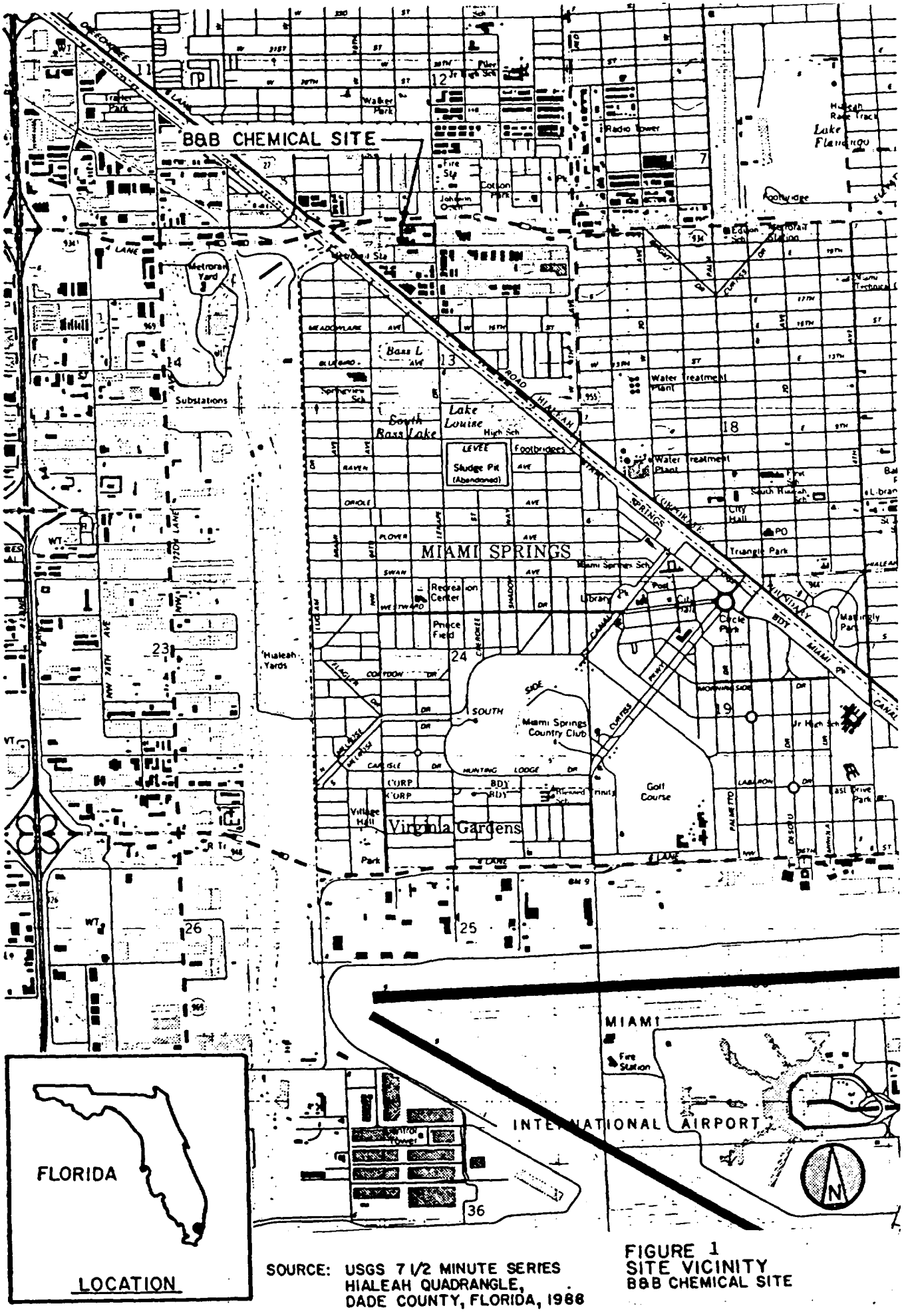
A gate at the southwest corner of the facility provides access to the walled compound that comprises the site. The western portion of the site is used for employee parking. A guard station is located in this area to control access to facility (Figure 2).

Administrative and manufacturing operations are housed in buildings located in the southwest and south-central portion of the site. Warehouse and storage areas for raw materials and finished goods are located in the eastern and northern portions of the site. Two tank farms are located in the northeast corner and south-central portion of the site. However, only the south-central tank farm is currently in use. Approximately four tanks are located in each area, ranging in capacity from 5,000 to 10,000 gallons each. The areas surrounding the buildings and tank farms, as well as the parking area, are covered by either asphalt or concrete pavement. The southeast corner of the site is unpaved and covered with gravel and grass. A storm drain system, consisting of infiltration trench drains, allows percolation of storm water runoff into the water table. The existing storm drain system is not connected to the municipal drainage system.

Ground elevation differences are slight. While a maximum elevation of seven and a half feet above mean sea level (amsl) is found along the eastern boundary of the site, the ground surface slopes to a minimum of five feet amsl near the northwestern corner of the site. The south-central area is higher than immediately surrounding areas.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

B&B Tritech, Inc., f/k/a, B&B Chemical, Inc. (B&B), was incorporated in the State of Florida in 1953 and began construction of the Hialeah facilities in 1959. Since its initial construction, the site has expanded to its current size through a series of additions. Prior to completion of construction in early 1963, its products were mixed in Atlanta, GA. Products were delivered to the B&B facility in Hialeah, or directly to the B&B customers. B&B began mixing products at the Hialeah facility in early 1963 and gradually increased its product line. Chemicals and other products



SOURCE: USGS 7 1/2 MINUTE SERIES
HIALEAH QUADRANGLE,
DADE COUNTY, FLORIDA, 1988

FIGURE 1
SITE VICINITY
B&B CHEMICAL SITE

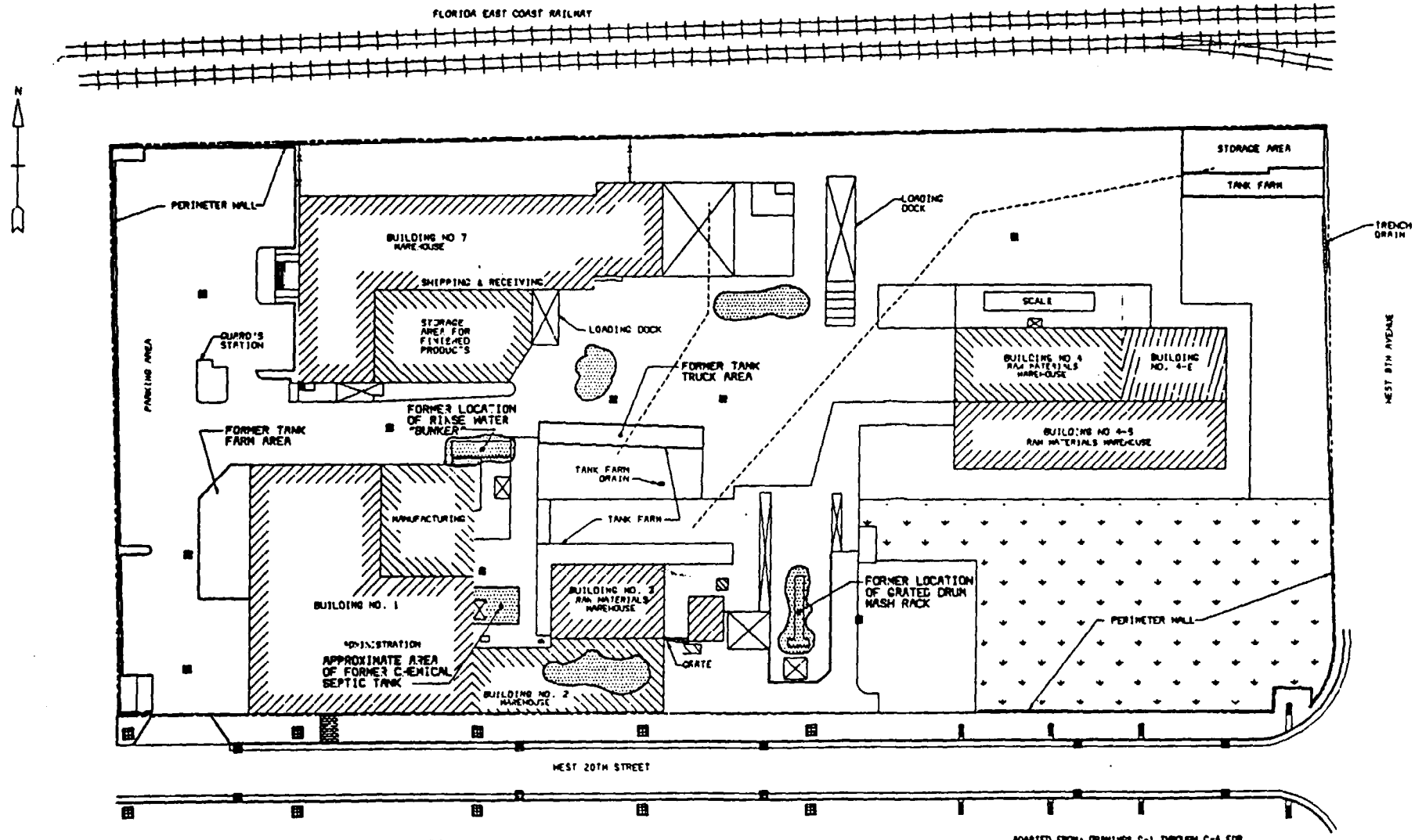


FIGURE 2
FACILITY LAYOUT AN
FORMER DISPOSAL AR
B&B CHEMICAL SITE
RI/FS WORK PLAN

known to have been used by the facility include a variety of solvents, polishes, detergents, oxidizing agents, corrosive inhibitors and metal cleaners.

In the mid-1970's, Dade County Department of Resource Management (DERM) inspectors documented the presence of wastewater residues in soakage pits at the site. Subsequent to this, the Department issued a Cease and Desist Order, related to the wastewater discharge to the soakage pits. In May 1976, B&B put a wastewater pretreatment system into operation. In the course of a 1979 area-wide groundwater study conducted for DERM, two samples were taken from irrigation wells located on the B&B Site. Analytical data from these samples indicated the presence of trans- 1,2-dichloroethylene, tetrachloroethylene, chlorobenzene, 1,1-dichloroethane, vinylidene chloride and trichloroethylene. In September 1981, construction workers installing a potable water line immediately south of the B&B Site experienced skin irritation. Analytical data from a groundwater sample collected from the ditch indicated the presence of phenol, trichloroethylene, tetrachloroethylene, vinylidene chloride, trans-1,2 dichloroethylene and cis-1,2 dichloroethylene. During the construction of the Metrorail track immediately south of the B&B Site in June 1982, workers also complained of skin burns, while working in trenches. A soil sample taken from the trench was analyzed and, through gas chromatography, was found to be similar to a B&B product. In October 1983 DERM issued an Administrative Order, directing B&B to develop plans for a groundwater monitoring system. DERM filed a civil suit against B&B in November 1984 for the substantial delay in submitting the requested groundwater monitoring plan.

In August 1985, DERM requested that EPA investigate conditions at the site. EPA obtained a warrant from the Federal District Court in Miami to install monitoring wells and sample groundwater and soil. Results of the EPA-funded investigation were documented in the July 1986 report entitled, "Geologic and Sampling Investigation Report: B&B Chemical Company, Hialeah, FL." Subsequently, EPA used the findings of this report to compute an Hazard Ranking System (HRS) score of 35.35 for groundwater at the site.

In February 1986, a separate investigation was conducted at the location of the former Crown Paint, Inc. and Fullerton Metals, Inc., currently the location of the Dade County Okeechobee station and parking garage. The properties, located immediately east of the B&B Site and acquired by Dade County through eminent domain in 1981, were found to contain approximately 120 drums of paint waste. Most of the drums were reported to be in good condition; however, some have either rusted or expanded, breaking the containers. Yet others had been tipped over, spilling their contents onto the ground. A removal action was completed in January 1984. Subsurface soil and groundwater samples were collected from locations in and around the perimeter of the Metrorail parking

garage. The investigation concluded that, although significant subsurface soil or groundwater contamination attributable to the former entities was not found, contaminated areas may have existed beneath the Metrorail structure.

During 1987, B&B had a RI/FS and a remedial action plan (RAP) prepared by an environmental consulting firm. The RI was found to be deficient by EPA and FDEP, based on the NCP requirements. Nevertheless, late in 1987 an Order of Dismissal and a Court Order Stipulation of Settlement were signed by DERM and B&B in Dade County Circuit Court. This agreement required the construction and operation of a groundwater recovery and treatment system. Operation of the system started in late August 1988.

The site was proposed for the NPL in June 1988 and listed on the NPL in August 1990.

In April 1989, EPA sent notice letters to B&B, offering the company the opportunity to conduct the RI/FS and informed them of their potential liability for all costs associated with the site. B&B Chemical, Inc. declined to perform an EPA-approved RI/FS.

The U.S. District Court for the Southern District of Florida granted EPA access to the site in November 1990, permitting EPA to obtain environmental samples for the RI/FS.

In March 1992, B&B Tritech, Inc.'s petition for judicial review of the site's listing on the NPL was denied by the District of Columbia U.S. Court of Appeals.

In August 1992, EPA issued an initial Proposed Plan for the site. This plan, based, in part, on the 1991 round of groundwater data, proposed a contingency remedy, whereby groundwater would be monitored on a quarterly basis. If MCLs were exceeded for two consecutive quarters, a groundwater remediation system was to be designed and built.

EPA resampled the site's wells in September 1992, four weeks after Hurricane Andrew. This round showed considerably higher concentrations of groundwater contaminants in a number of source-area and downgradient well clusters, as compared to the March 1991 round. (Three subsequent rounds of sampling took place, beginning in February 1993 and ending in January 1994.) In May 1993, prior to the final round of sampling, EPA issued an Unilateral Order requiring the removal of the pump from the groundwater recovery well. In June 1993, EPA locked the single recovery well located onsite.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

In September 1989, EPA printed and distributed a fact sheet describing the activities to be conducted during the RI and FS. A Community Relations Plan was prepared by EPA in April 1990. The initial Proposed Plan for the B&B Chemical Superfund Site was released to the public on August 13, 1992. The administrative record, which contained documents relating to the remedy selection at the site, including the RI/FS reports and the initial Proposed Plan, was made available to the public at the Region IV EPA Office in Atlanta, Georgia and the John F. Kennedy Library in Hialeah, Florida. The notice of availability of the administrative record was published in the Miami Herald on August 13, 1992. The initial public comment period was held from August 13, 1992 to September 12, 1992. In addition, a public meeting was scheduled on August 26, 1992, but was canceled because of the impact of Hurricane Andrew on the Hialeah area. The meeting was rescheduled and held on September 29, 1992 at the John F. Kennedy Library. At this meeting, representatives from EPA answered questions about the facts surrounding the site.

A second public comment period was started on May 20, 1994 and ended on June 20, 1994. This second comment period was held to present the second Proposed Plan, which considered the groundwater analytical data collected during the 1992 through 1994 monitoring period. On June 1, 1994, a second public meeting was held at the John F. Kennedy Library in Hialeah, Florida. Notice of the public meeting and comment period was published in the Miami Herald on May 19, 1994.

4.0 SCOPE OF REMEDIAL ACTION

This is the first and final planned remedial action for this site. The remedial action selected at this site would protect human health and the environment from potential exposure to the contaminated groundwater in the Biscayne aquifer. The objectives for the remedy are to prevent disturbance of the site's contaminated soil and to monitor groundwater quality to confirm that natural attenuation is, indeed, occurring.

5.0 SITE CHARACTERISTICS

5.1 GEOLOGY AND HYDROGEOLOGY

The B&B Site is located over the Biscayne aquifer, the sole source of freshwater for South Florida and part of the surficial aquifer system. In descending order, the general stratigraphic sequence of the Biscayne aquifer is the Pamlico Sand, Miami Oolite, Anastasia Formation, Key Largo Limestone, Fort Thompson Limestone, and permeable limestones of the Tamiami Formation (Figure 3). These units are composed principally of limestones, sandstones, sand, shell and silt. The base of the Biscayne aquifer is formed by the

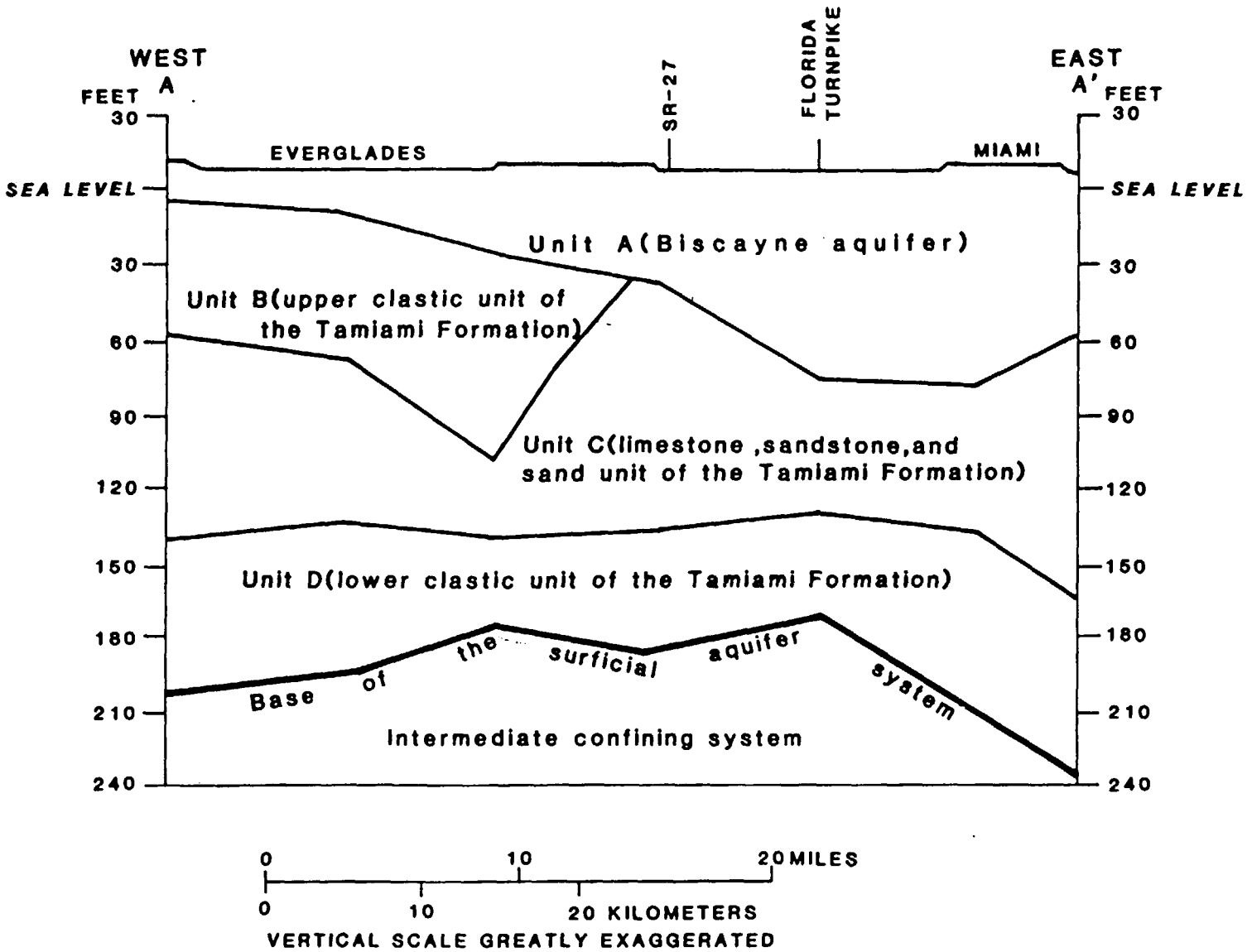


Figure 3.--Generalized hydrogeologic cross section of the surficial aquifer system, Dade County.
(modified from Causarás, 1987.)

low-to-moderately permeable interval of sand, shell and silt, belonging to the upper clastic unit of the Tamiami Formation. The Tamiami Formation, in turn, overlies the intermediate confining unit, which separates the surficial aquifer system from the underlying Floridan aquifer system.

Locally, the Biscayne aquifer is 150 feet thick and overlies approximately 140 feet of the less permeable portions of the Tamiami Formation and approximately 600 feet of the intermediate confining unit. The top of the Floridan aquifer system is present at about 900 feet below land surface.

Aquifer tests conducted during the remedial investigation indicate that the hydraulic conductivity of the upper-most part of the Biscayne aquifer ranges from 1.6 ft/day to 37.7 ft/day. The estimated groundwater velocity ranges from 0.23 ft/year to 5.7 ft/year.

Due to the nearly flat groundwater gradient observed locally, groundwater flow directions are primarily influenced by pumpage at the Miami Springs/Preston public water supply well fields, located within one half a mile south southeast of the site. In addition, management of water levels in the canals, in order to minimize salt water intrusion during the winter months, also is likely to influence groundwater flow directions.

5.2 SURFACE WATER

The Miami Canal is located within 800 feet of the southwestern corner of the site. The canal supports aquatic wildlife and plants. No federally listed, proposed, or candidate endangered species are known to inhabit the Miami Canal.

5.3 SAMPLING RESULTS

The emphasis of the EPA RI was on determining the nature and extent of impacts caused by past disposal practices. Towards this end, soil, surface water and groundwater were sampled and analyzed. The following summarizes the sampling results.

5.3.1 SOIL

Surface Soil

A total of three composite surface soil samples were analyzed from six locations in the only unpaved area of the site. Data from these samples showed absent-to-very low concentrations of organic contaminants.

Subsurface Soil

Subsurface soil borings were completed to depths of 15 feet below

land surface (bls) at 11 locations (Figure 4). The locations of the borings were primarily selected on the basis of the descriptions of the former soakage pits and other disposal areas contained in the DERM inspector's reports. Two soil samples were collected for analysis from each soil boring. Generally a sample was collected from above the water table (2 to 4 feet bls) and another sample from below the water table (12 to 14 feet bls).

Seven of the 11 soil borings were located within the south-central area of the site and targeted the area of the former chemical septic tank, former rinse water bunker, vehicle wash area and soakage pits.

With the exception of trace amounts of volatile compounds detected in the deep sample taken in the vicinity of the eastern tank farm area, the eastern, western and northern areas were generally free of contaminants (Table 1). This is in contrast to the south-central part of the site, where the majority of soil borings encountered organic contaminants. The highest concentrations of both volatile and semivolatile contaminants were found in the deep samples (Table 1). The soil borings that targeted the vehicle wash facility, former rinse water bunker and chemical septic tank area encountered significantly higher organic contaminants.

Some of the subsurface soil organic contaminants also found in the site's groundwater are chlorobenzene, toluene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2-methylnaphthalene, xylene, ethyl benzene, benzene and phenol.

With the exception of the chromium detected in both the deep and shallow sample from the vehicle wash facility area, inorganic analytes were not found at elevated concentrations in any of the soil borings.

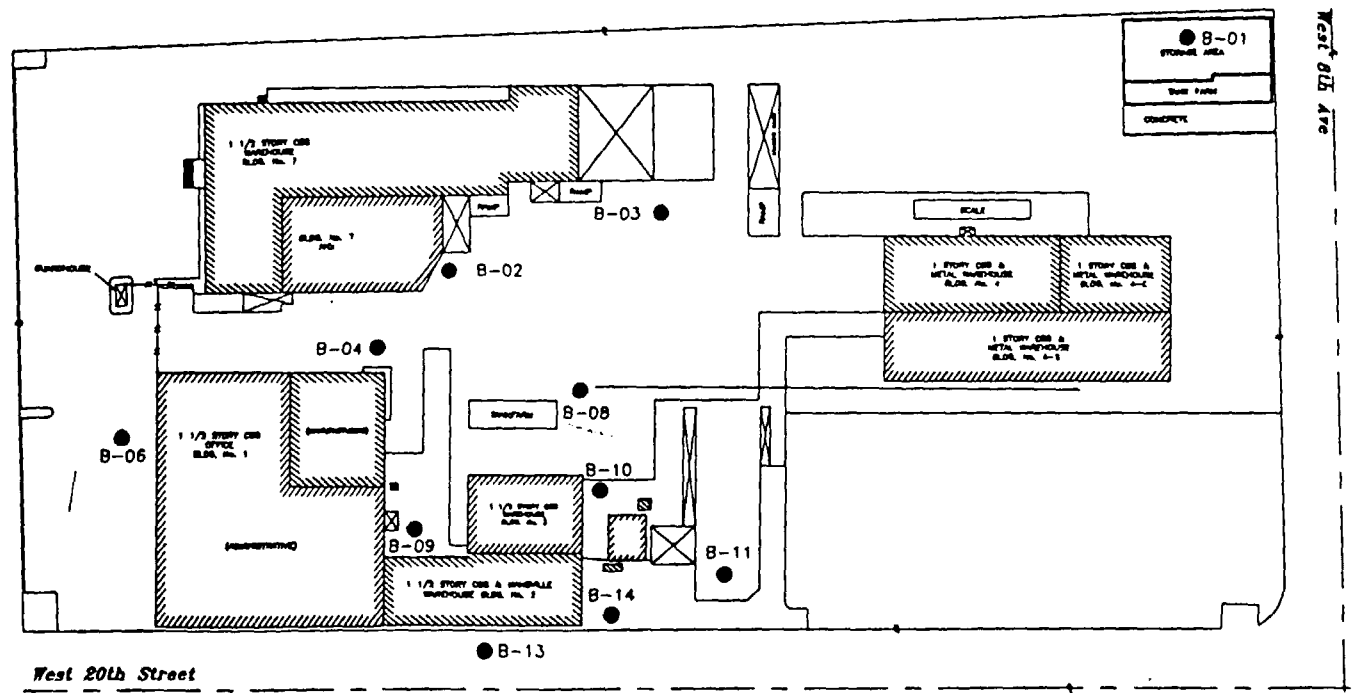
5.3.2 SURFACE WATER AND SEDIMENT

Surface water samples were collected from the onsite water runoff collection and infiltration system. Sufficient amounts of sediment were not present in the inlets to permit sampling.

No contaminants were detected in any of the surface water samples collected at the site.

5.3.3 GROUNDWATER

Twenty seven on- and off-site groundwater monitoring wells were sampled during the 1991 RI and subsequent rounds of groundwater sampling (Figure 5). Of these groundwater monitoring wells, 20 were installed during the 1985 Field Investigation Team (FIT) study and seven during the 1991 RI.



LEGEND

●-B-04 — BORE HOLE LOCATION AND DESIGNATION

SOURCE: WEDDNER SURVEYING AND MAPPING PA

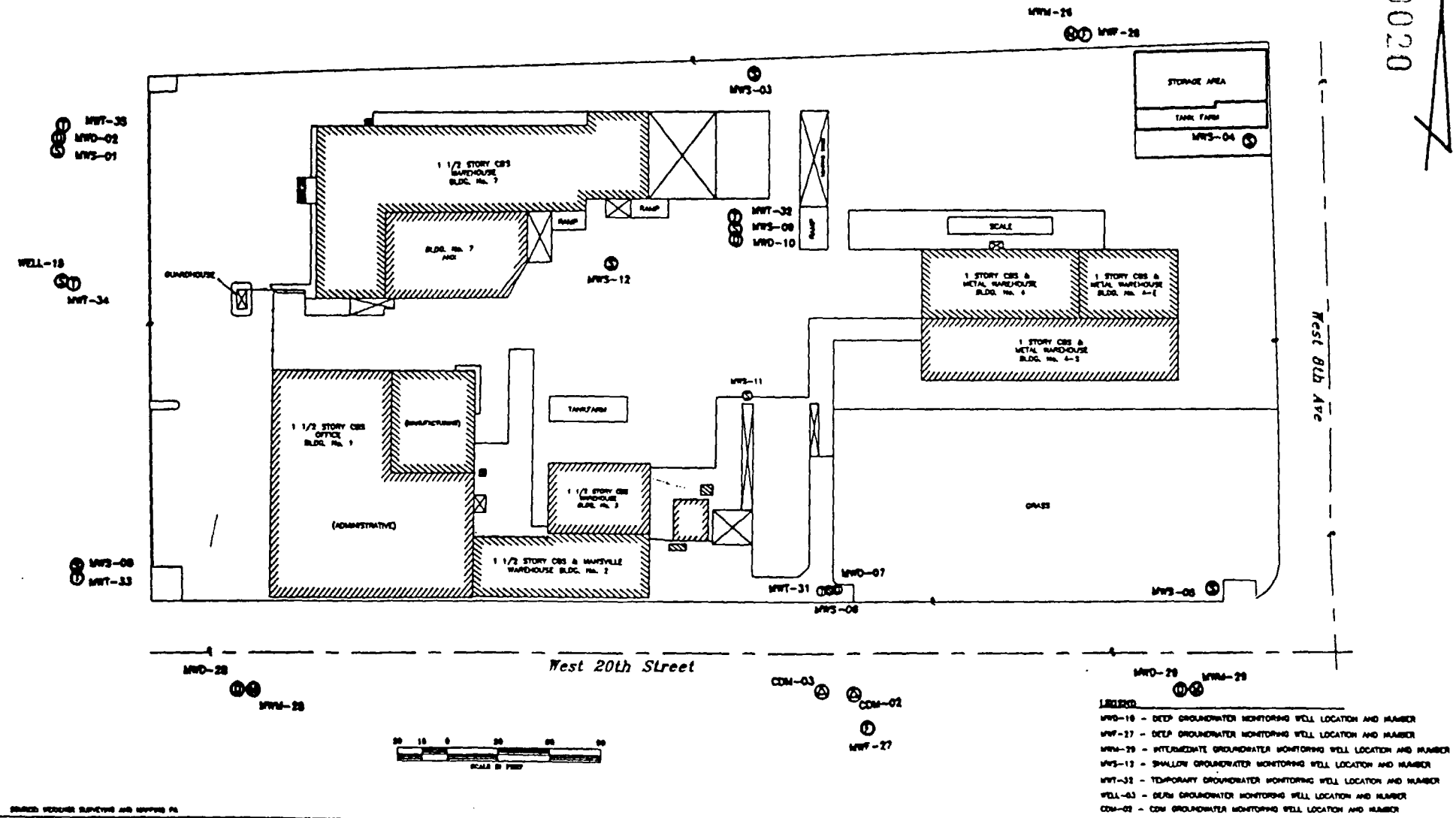
	SOIL BORING LOCATIONS	B & B CHEMICAL RI HIALEAH, FLORIDA	FIGURE 4

Table 1

CONCENTRATIONS OF ORGANIC CONTAMINANTS DETECTED DURING RI (1991)
SUBSURFACE SOIL
B&B CHEMICAL NPL SITE

	Shallow Soil (2 - 4 feet)(1) Range (mg/kg)	Deep Soil (12 - 14 feet) Range (mg/kg)
	South-central Area (4)	
VOCs(2)	0.004 - 54.4	0.18 - 34.6
SVs(3)	0.130 - 78.6	0.21 - 138.5
	Eastern Area(5)	
VOCs	0.14	0.49
SVs	ND	ND
	Western Area(6)	
VOCs	ND	0.03
SVs	ND	ND
	Northern Area(7)	
VOCs	ND	ND
SVs	ND	ND

(1) Depth of soil sample in feet below ground surface
(2) Total volatile organics, excluding the common lab contaminants methylene chloride and acetone
(3) Total semivolatile organic compounds, excluding esters of phthalates
(4) Soil borings B-04, B-08 through B-13 and B-14
(5) Soil boring B-01
(6) Soil boring B-06
(7) Soil borings B-02 and B-03



ENVIRONMENTAL SCIENCE AND TECHNOLOGY CORP.	MONITORING WELL LOCATION MAP	B & B CHEMICAL HIALEAH, FLORIDA	FIGURE 5

1985 FIT Investigation

During the 1985 FIT investigation, the highest concentrations of groundwater contaminants were found in the shallow (7 to 10 feet bls) and intermediate (10 to 25 feet bls) depth monitoring wells, located in the south-central portion of the site (Table 2). Volatile organic compounds were the principal contaminants detected. In addition, the tentatively identified organic compounds were significant contributors to the organic contaminant fraction in the groundwater. Lower concentrations of organic contaminants were found in the deep (40 to 75 feet bls) monitoring wells.

The inorganic analytes cadmium, chromium and lead were found at higher concentrations in the western part of the site (Table 2). An exception is the chromium found in the deep well located in the south-central part of the site where chromium was found at 210 ppb. This well is discussed further below.

1991 RI

The groundwater sampling for the 1991 RI occurred thirty two months after start-up of the groundwater recovery and treatment system. At this time, a minimum of 37 million gallons of groundwater is reported to have been recovered by a single 20-foot recovery well, located in the south-central portion of the site.

The highest concentrations of volatile organic contaminants detected were found in the shallow (7 to 20 feet bls) wells, located in the south-central portion of the site (Table 3). Tentatively identified compounds were also found to be present at this location and at significantly higher concentrations, as compared to those compounds on the target compound list. Organic compounds found to be marginally above State of Florida or federal MCLs during the 1991 RI were vinyl chloride and benzene. Inorganic contaminants above MCLs were cadmium, chromium and lead. These analytes too were marginally above MCLs.

September 1992 Groundwater Monitoring

Four weeks after EPA issued the initial Proposed Plan and five weeks after Hurricane Andrew, EPA resampled the site's groundwater monitoring wells in late September 1992 and had the samples analyzed for VOCs and metals. Although there is no record of total rainfall at the Miami-Dade Sewer and Water Authority's rain gauge on the day of Hurricane Andrew's landfall, 3.3 inches were recorded the following day. This translates to approximately 400,000 gallons of rain falling within the site's walled compound. A significant volume of rain water probably entered the storm drain system, possibly flushing the contaminants present in the soil located in the south-central part of the site (Section 5.3.1).

TABLE 2

CONCENTRATIONS OF CONTAMINANTS DETECTED DURING FIT INVESTIGATION (1985)
GROUNDWATER
B&B CHEMICAL NPL SITE

	Shallow Wells (7 - 10 feet)(1) Range (ug/L)	Intermediate Wells (10 - 25 feet) Range (ug/L)	Deep Wells (40 - 75 feet) Range (ug/L)
		South-central Area	
VOCs(2)	320	14 - 423	14
SVs(3)	93	57 - 96	80
TICs(4)	710	930	240
Cadmium	4	ND	ND
Chromium	10	16 - 25	210
Lead	4	2.6 - 3.4	7
		Eastern Area	
VOCs	-	ND	-
SVs	-	ND	-
TICs	-	ND	-
Cadmium	-	4.5	-
Chromium	-	ND	-
Lead	-	3.4	-
		Western Area	
VOCs	4.9	1.4 - 12.1	4.5
SVs	9.9	14	ND
TICs	ND	ND	ND
Cadmium	40	ND	ND
Chromium	27 - 240	15 - 20	11
Lead	10 - 41	7 - 23	2.6

TABLE 2 (continued)

CONCENTRATIONS OF CONTAMINANTS DETECTED DURING FIT INVESTIGATION (1985)
GROUNDWATER
B&B CHEMICAL NPL SITE

	Shallow Wells (7 - 10 feet)([1]) Range (ug/L)	Intermediate Wells (10 - 25 feet) Range (ug/L)	Deep Wells (40 - 75 feet) Range (ug/L)
		Northern Area	
VOCs	ND	13	5
SVs	28	ND	ND
TICs	290	ND	ND
Cadmium	ND	ND	ND
Chromium	ND	25	ND
Lead	ND	3 - 5	ND
		Background(5)	
VOCs	-	1.5	2.1
SVs	-	ND	ND
TICs	-	ND	ND
Cadmium	-	ND	4
Chromium	-	ND	ND
Lead	-	ND	ND

([1]) Depth of well screen in feet below ground surface
([2]) Total volatile organics, excluding the common lab contaminants methylene chloride and acetone
([3]) Total semivolatile organic compounds, excluding esters of phthalates
([4]) Total tentatively identified and unidentified compounds
([5]) Intermediate and deep data from wells MWS-13 and MWD-14, respectively

TABLE 3

CONCENTRATIONS OF CONTAMINANTS DETECTED DURING RI (1991)
GROUNDWATER
B&B CHEMICAL NPL SITE

	Shallow Wells (7 - 20 feet)(1) Range (ug/L)	Intermediate Wells (35 - 55 feet) Range (ug/L)	Deep Wells (75 - 105 feet) Range (ug/L)
		South-central Area	
VOCs(2)	2 - 87	3	2 - 12
SVs(3)	5 - 7	ND	ND
TICs(4)	160 - 760	ND	10
Cadmium	ND	ND	ND
Chromium	21 - 55	ND	11 - 19
Lead	6 - 8	5	ND
		Eastern Area	
VOCs	ND	3 - 8	-
SVs	ND	18 - 73	-
TICs	ND	10	-
Cadmium	ND	ND	-
Chromium	12	55 - 120	-
Lead	ND	4 - 30	-
		Western Area	
VOCs	ND	3 - 7	-
SVs	ND	11	-
TICs	9	20	-
Cadmium	5	9	-
Chromium	11 - 12	4	-
Lead	11 - 13	5	-

TABLE 3 (Continued)

CONCENTRATIONS OF CONTAMINANTS DETECTED DURING RI (1991)
GROUNDWATER
B&B CHEMICAL NPL SITE

	Shallow Wells (7 - 20 feet) Range (ug/L)	Intermediate Wells (35 - 55 feet) Range (ug/L)	Deep Wells (75 - 105 feet) Range (ug/L)
		Northern Area	
VOCs	1 - 2	ND	-
SVs	ND	ND	-
TICs	180	ND	-
Cadmium	ND	ND	-
Chromium	13 - 27	9	-
Lead	5 - 8	8	-
		Background(5)	
VOCs	ND	4	2
SVs	ND	ND	20
TICs	ND	10	10
Cadmium	ND	ND	ND
Chromium	ND	22	ND
Lead	ND	ND	ND

(1) Depth of well screen in feet below ground surface
(2) Total volatile organics, excluding the common lab contaminants methylene chloride and acetone
(3) Total semivolatile organic compounds, excluding esters of phthalates
(4) Total tentatively identified compounds
(5) Shallow, intermediate and deep data from wells MWS-03, MWM-26 and MWF-26, respectively

Groundwater contaminants were observed to rise primarily in the shallow (7 to 10 feet bls) and intermediate (10 to 25 feet bls) monitoring wells located in the south-central port of the site, as well as those wells located immediately south and southeast of the site. Appendix A contains tables summarizing the groundwater monitoring data, starting with the March 1991 RI and ending with the January 1994 round. The same appendix contains summary plots of total VOC concentrations for upgradient, south-central and regionally downgradient monitoring well clusters.

As may be seen from the tables and plots presented in Appendix A, the trace concentrations of VOCs detected in the upgradient wells declined to near or below detection limits during September 1992. In contrast, the shallow and intermediate wells located in the south-central and regionally downgradient well clusters increased considerably. Maximum contaminant levels were exceeded for vinyl chloride, benzene and chlorobenzene.

The inorganic analytes cadmium, chromium and lead were found to be marginally above MCLs during the September 1992 sampling. In each case, prior or succeeding sampling of the well found in exceedence did not confirm the presence of the analyte.

1993-1994 Groundwater Monitoring

Following the September 1992 round of groundwater sampling, three subsequent rounds of sampling took place, ending in January 1994. Although concentrations declined significantly, relative to the September 1992 round, the wells located in the south-central part of the site had detectable concentrations of volatile and semivolatile organic compounds. With the exception of vinyl chloride, the contaminants detected were below MCLs. The shallow south-central area wells contained tentatively identified compounds at concentrations two orders of magnitude above the concentrations found in the upgradient wells.

As was the case in previous sampling rounds, the inorganic analytes cadmium, chromium and lead were present sporadically and at marginal concentrations. As was mentioned above, since 1985 the deep well located in the south-central part of the site has exceeded the chromium MCL of 100 ug/L on three out of the six times it was sampled. As a result of turbidity measurements made on the well in 1994 and observations made during well purging, the elevated chromium is believed to be the product of well-construction artifact.

6.0 SUMMARY OF SITE RISKS

CERCLA directs EPA to protect human health and the environment from current and potential exposure to hazardous substances at the site. In order to assess the current and potential risk from the site, a baseline risk assessment was conducted. This assessment evaluated

the potential risk posed by the site without the benefit of any future remediation. Results of the risk assessment are contained in the Final Baseline Risk Assessment (BRA) report, October 1992 and the May 1994 addendum to the BRA. The BRA 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 RI and subsequent rounds of groundwater sampling provided the basis for the risk evaluation.

6.1 CONTAMINANTS OF CONCERN

Based on soil sampling results from the 1991 RI and the update to the 1992 Risk Assessment using the January 1994 groundwater data, the risks associated with the site are within EPA's discretionary risk range, discussed below in Section 6.4. The risk associated with exposure to the site's groundwater, however, is greater than EPA's goal of less than 10^{-6}. During the 1992-1993 groundwater monitoring period, State of Florida and federal MCLs were exceeded for vinyl chloride, benzene, chromium and chlorobenzene. Table 4 presents those groundwater contaminants which exceeded MCLs during this monitoring period and the frequency with which the contaminants were detected.

6.2 EXPOSURE ASSESSMENT SUMMARY

Whether a contaminant is actually of concern to human health and the environment depends upon the likelihood of exposure, e.g., whether the exposure pathway is currently complete or could be complete in the future. A complete exposure pathway (a sequence of events leading to contact with a contaminant) is defined by the following four elements:

- A source and mechanism of release from the source;
- A transport medium (e.g., groundwater, air, etc);
- The presence or potential presence of a receptor at the exposure point; and
- A route of exposure (e.g., ingestion, inhalation, dermal absorption, etc)

If all four elements are present, the pathway is considered complete.

An evaluation was undertaken of all potential exposure pathways which could expose human receptors to the various contaminant sources. All possible pathways were first hypothesized and evaluated for completeness using EPA criteria. One current potentially complete exposure pathways and three future exposure pathways remained after screening. The current pathways represent

TABLE 4

CONTAMINANTS OF CONCERN: GROUNDWATER[1]
B&B Chemical National Priorities List Site

Contaminant	Range of Concentrations	Frequency of Detection	State/Federal MCL (ppb)
Vinyl Chloride	1.3 - 14.0	9/27	1 ppb (2)
Benzene	3.0 - 8.0	2/27	1 ppb (2)
Chlorobenzene	110 - 140	2/27	100 ppb (2,3)
Chromium	130 - 210	2/27	100 ppb (2,3)

(1) Contaminants of concern selected on exceedences of federal and State of Florida MCLs during 1992-1994 monitoring period.
(2) State of Florida MCL
(3) Federal MCL

exposure pathways which could exist under current site conditions, while the future pathways represents exposure pathways which could exist if the current exposure conditions change. The current exposure pathways were developed for the Baseline Risk Assessment. Exposure by each of these pathways was mathematically modeled using generally conservative assumptions.

The following pathways were evaluated under current land-use conditions:

- Exposure of onsite workers to contaminants in surface soil through incidental ingestion and dermal contact

The following pathways were evaluated under a future land-use conditions:

- Exposure of onsite construction workers to contaminants in surface and subsurface soil through incidental ingestion, dermal contact, and to contaminants in air (dust vapor) through inhalation;

- Exposure of trespassers to contaminants in surface soil through incidental ingestion and dermal contact; and

- Exposure of onsite residents to contaminants in groundwater through ingestion, dermal contact and inhalation

The exposure point concentrations for each of the contaminants of potential concern and the exposure assumptions for each pathway were used to estimate the chronic daily intakes for the potentially complete pathways. The chronic daily intakes were then used in conjunction with cancer potency factors and noncarcinogenic reference doses to evaluate risk.

The groundwater at the B&B Site currently contains concentrations of site-related contaminants at levels which may pose a risk to human health, if the groundwater were to be used for human consumption. Exceedences of MCLs have been observed for a number of analytes over the past two years. Locally the Biscayne aquifer is not currently being used as a source of potable water; however, the Miami-Dade Water and Sewer Authority produces water from the Miami Springs/Preston wellfields, located less than a mile from the site. This wellfield yields an average of approximately 140 million gallons per day. The site lies within the cone of the depression caused by groundwater pumpage from this wellfield. Due to the area-wide groundwater contamination, groundwater produced by this wellfield is treated by air stripping of volatile organic contaminants , prior to distribution. Semivolatile organic and inorganic contaminants are not treated.

The major assumptions made regarding exposure frequency and duration, used to estimate risk under the various future land-use

scenarios are presented in Table 5.

6.3 TOXICITY ASSESSMENT SUMMARY

Toxicity values are used in conjunction with the results of the exposure assessment to characterize site risk. EPA has developed critical toxicity values for carcinogens and noncarcinogens.

Slope factors (SF) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor Workgroup for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic contaminants. SFs are derived from the results of human epidemiological studies or chronic animal bioassay to which animal-to-human extrapolation and uncertainty factors have been applied. SFs, which are expressed in units of $(mg/kg/day)^{-1}$, 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 an intake level. The term "upper bound" reflects the conservative estimate of the risk calculated from the SF. Use of this conservative approach makes underestimation of the actual cancer risk highly unlikely.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to contaminants 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 contaminants of potential concern from environmental media 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 Rfd will not underestimate the potential for adverse noncarcinogenic effects to occur.

Exposure to a contaminant was quantified by calculating the chronic daily intake (CDI, or dose of each contaminant of potential concern). CDIs for potential carcinogens were calculated by averaging exposure over a lifetime. CDIs for non-carcinogens were calculated by averaging over the period of exposure. CDIs were estimated using concentrations of contaminants (expressed as the reasonable maximum exposure, RME) together with other exposure parameters that specifically describe the exposure pathway.

6.4 RISK CHARACTERIZATION SUMMARY

Human health risks are characterized for potential carcinogenic and noncarcinogenic effects by combining exposure and toxicity information. Excessive lifetime cancer risks are determined by multiplying the estimated daily intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g.,10^{-6}). An excess lifetime

TABLE 5
MAJOR PARAMETERS FOR EXPOSURE SCENARIOS
CURRENT AND FUTURE LAND-USE CONDITIONS

B&B CHEMICAL NPL SITE

SURFACE SOIL

Parameter	INGESTION		DERMAL	
ABSORPTION				
	Worker Onsite	Trespasser Onsite	Worker Onsite	Trespasser Onsite
Exposure Frequency (days/year)	250	100	250	100
Exposure Duration (years)	25	30	25	30
Soil Ingestion Rate (mg/day)	50	100	-	-
Soil to Skin Adherence Factor (mg/cm2)	-	-	0.2	0.2

SUBSURFACE SOIL

	INGESTION		DERMAL ABSORPTION
	Worker Onsite	Trespasser Onsite	Worker Onsite
Exposure Frequency (days/year)	260	100	260
Exposure Duration (years)	1	30	1
Soil Ingestion Rate (mg/day)	480	100	-
Soil to Skin Adherence Factor (mg/cm2)	-	-	0.2

TABLE 5 (Continued)

MAJOR PARAMETERS FOR EXPOSURE SCENARIOS
CURRENT AND FUTURE LAND-USE CONDITIONS
B&B CHEMICAL NPL SITE

GROUNDWATER

	INGESTION		VOLATILES INHALATION DURING SHOWERING		DERMAL CONTACT GROUNDWATER	
	Adult	Child	Adult	Child	Adult	Child
Exposure Frequency (days/year)	350	350	350	350	350	350
Exposure Duration (years)	24	6	24	6	24	6
Ingestion Rate (liter/day)	2.0	0.44	-	-	-	-
Inhalation Rate (m3/hour)	-	-	0.8	0.8	-	-
Shower Duration (hour)	-	-	0.2	0.2	-	-
Skin Surface Area Available (cm2)	-	-	-	-	18,200	7,200

Source: U.S. EPA, Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors, Office of Solid Waste and Emergency Response, OSWER Directive 9285.6-03, Washington, DC, 1991

cancer risk of 10^{-6} indicates that, as a plausible upper bound, an individual has a one in a million additional (above the background cancer incidence rate) chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the assumed specific exposure conditions at the site. Likewise, an excess lifetime cancer risk of 10^{-4} indicates that an individual has a one in ten thousand additional chance of developing cancer.

The Agency considers individual excess cancer risks in the range of 10^{-4} to 10^{-6} as protective; however, the 10^{-6} risk level is generally used as the point of departure for setting cleanup levels at Superfund sites. The point of departure risk level of 10^{-6} expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range.

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 which exceeds one (1) indicates that the daily intake from a scenario exceeds the contaminant's reference dose. By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonable be 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. An HI which exceeds unity indicates that there may be a concern for potential health effect resulting from the cumulative exposure to multiple contaminants within a single medium or across media.

The evaluation of risks associated with the site's surface and subsurface soil concluded that under both current and future exposure scenarios, noncarcinogenic risks are below 1, the level of concern non noncarcinogens. The hazard indexes for current onsite workers, future construction workers and future trespassers were $1.9X10^{-2}$, $6.9X10^{-1}$, and $1.4X10^{-2}$, respectively.

The evaluation of risks associated with the site's surface and subsurface soil concluded that carcinogenic risks associated under both current and future exposure scenarios were well below 10^{-4}, the level of concern for carcinogens. The cancer risks for current onsite workers, future construction workers and future trespassers were $2.7X10^{-6}$, $3.4X10^{-6}$ and $2.7X10^{-6}$, respectively.

The evaluation of noncarcinogenic risks associated with the site's groundwater, calculated using the most recent (January 1994) data, concluded that risks associated with any future exposure scenarios were below 1. Hazard indexes calculated ranged from $1.88X10^{-1}$ (MWD-07) to $6.6X10^{-3}$ (MWF-27).

The evaluation of risks associated with the site's groundwater,

also calculated using the most recent (January 1994) data, concluded that the carcinogenic risk under future exposure scenarios were below 10^{-6}. The carcinogenic risk ranged from $7.5X10^{-5}$ (MWD-07) to $4.9X10^{-7}$ (CDM-03).

There are uncertainties associated with any quantitative risk assessment. Groundwater from the B&B Site contains elevated concentrations of tentatively identified compounds, predominantly ethylbenzenes and phenolic compounds. In January 1994, the shallow wells in the south-central part of the site contained concentrations of these compounds ranging from 1,230 ug/L to 1,960 ug/L. The presence of these compounds, primarily in the south-central part of the site, contributes to uncertainties related to the BRA, as toxicity data does not exist for the compounds. Thus, the risk attributable to these volatile and semivolatile compounds could not be quantified. Elimination of compounds may result in an underestimation of risk. In addition, there are uncertainties associated with summing cancer risks or hazard indices for different chemicals. The assumption of dose additivity ignores possible synergism or antagonism among chemicals and differences in mechanisms of action and metabolism. It is not known what effects this has on the total risk number.

Given the presence of contaminants concentrations greater than MCLs and the risk levels discussed above, actual or threatened releases of hazardous substances from this site, if not addressed by a response action, may present an imminent and substantial endangerment to public health, welfare or the environment.

6.5 ENVIRONMENTAL RISK SUMMARY

The B&B Site currently provides little habitat for wildlife, as most of the site is paved or covered by warehouses. Further, the surrounding area is primarily industrial and residential and does not support extensive wildlife populations. Given the limited habitat value of the site and surrounding area, wildlife are unlikely to use the B&B Site to any significant degree. The intermittent exposures that could occur in the small unpaved area of the site or in the temporary puddles (primarily urban-adapted species) are not likely to result in any significant exposures in wildlife populations. Therefore, no significant ecological risk from the B&B Site is predicted to occur. The selected remedy, which is based on protection of human health will eliminate the potential for such toxic effects since the environmental exposure pathways will not exist.

6.6 REMEDIATION GOALS

Because all the contaminants of concern have MCLs, the MCL values were utilized as remedial goals for the site. The remediation goals for the contaminants of concern are presented in Section 9.C.1.

7.0 DESCRIPTION OF ALTERNATIVES

Five alternatives were considered for remediation of the contaminated groundwater at the B&B Site. Institutional controls that limit site access and usage, and semiannual groundwater monitoring are included in all the alternatives, except the No Action alternative.

7.1 ALTERNATIVE 1 - NO ACTION

The Superfund program requires the "No Action" alternative be considered at every site. The No Action alternative serves as a baseline with which the other alternatives can be compared. Under the No Action alternative, EPA would take no further action at the site to control or minimize the migration of the contaminated groundwater.

Because this alternative would result in contaminants remaining onsite, CERCLA requires that the site be reviewed every five years. If indicated by such a review, remedial actions would be implemented at that time to address the contaminated groundwater.

There is no cost associated with this alternative, as no additional activities would be conducted.

7.2 ALTERNATIVE 2 - NATURAL ATTENUATION, INSTITUTIONAL CONTROLS AND GROUNDWATER MONITORING

Alternative 2 involves the natural attenuation of groundwater contaminants; imposition of institutional controls over the south-central part of the property; and, groundwater monitoring to verify that natural attenuation is occurring.

Given the currently low contaminant concentrations in the groundwater and the observed decreasing trends in concentrations (Appendix B), it is anticipated that natural attenuation will further reduce groundwater contamination to below MCLs within two years.

The existing asphalt cover located over the south-central part of the B&B Site may be minimizing the leaching of contaminants into the groundwater by preventing the ready infiltration of rainfall through the vestiges of the former soakage pits, as well as other sources of groundwater contamination, documented by DERM and subsequently by EPA. Institutional controls shall be sought to insure that the asphalt cover is not disturbed, removed or the integrity of the asphalt cover is not otherwise compromised in any way. The asphalt cover will be inspected on an annual basis to ensure that the integrity of the asphalt cover has not been compromised. In the event that the asphalt cover is disturbed or otherwise compromised, EPA will be notified so that the Agency may reevaluate the situation and the appropriate action may be taken.

Limitations on the use of the Biscayne aquifer currently exist under Section 24-12(2)(Q) of the Dade County Code. These restrictions have the effect of prohibiting the use of the Biscayne aquifer for potable water when an approved water main is available and operational. Under this condition, the source of potable water is required to be from an approved public water supply main. County approval for use of private groundwater wells installed in the Biscayne aquifer for non-potable purposes, such as cooling, irrigation and filling of swimming pools is generally not difficult to obtain.

Semiannual groundwater monitoring of select groundwater monitoring wells would be conducted to verify that natural attenuation is occurring. Monitoring would continue until the groundwater contaminant concentrations have decreased to levels below MCLs for two consecutive rounds of semiannual sampling.

Groundwater monitoring of the select wells would be conducted to verify that:

- o MCLs are attained in the projected time frame;
- o The spike of groundwater contaminants observed in September 1992 does not recur; and
- o Further leaching of contaminants from the site's subsurface soil does not adversely impact the groundwater.

The total present worth cost of this alternative was estimated for five years. The five year period was selected by doubling the project two year time frame to reach MCLs and rounding. This total present work cost was estimated to be $92,400.

7.3 ALTERNATIVE 3 - GROUNDWATER EXTRACTION, PHYSICAL AND CHEMICAL TREATMENT, AND ONSITE INJECTION WELL DISCHARGE

This alternative involves the installation of recovery wells to actively remediate the low-level groundwater contaminants. Aquifer tests and additional groundwater modeling would have to be performed during the remedial design to determine the precise number and locations of extraction wells, as well as the necessary pumping rates.

The groundwater treatment system would consist of an air stripping tower for removal of volatile organic contaminants and, if necessary, chemical precipitation for removal of heavy metals. Should the groundwater treatment require heavy metals removal, it is likely that a sulfide precipitation process would be need to be used in order to achieve the remediation goals. The sludge from the precipitation process may be hazardous because it may contain heavy metals that could leach out. The sludge generated by the

system would have to be initially be analyzed to determine whether it is hazardous and to determine the proper offsite disposal method.

After treatment, the groundwater would be returned to the aquifer through an injection well or infiltration gallery. Percolation tests and limited modeling may be necessary to design the infiltration gallery. Returning the treated groundwater to the Biscayne aquifer would allow no net loss of groundwater.

The recovered and treated groundwater would have to be monitored to insure compliance with State of Florida and federal MCLs prior to reintroducing it into the aquifer.

This and all the remaining treatment alternatives would also require long-term groundwater monitoring, in order to follow contaminant concentration trends over time.

Assuming three recovery wells, the estimated capital cost for this alternative is $2,440,000 and the annual operation and maintenance (O&M) cost is estimated to be $214,600. The total present worth cost for 10 years operation of this alternative is estimated to be $4,097,100.

7.4 ALTERNATIVE 4 - GROUNDWATER EXTRACTION, PHYSICAL AND CHEMICAL TREATMENT, AND OFFSITE DISCHARGE TO SURFACE WATER

Alternative 4 is similar to Alternative 3, except that treated groundwater would be discharged into the Miami Canal instead of using an injection well or infiltration gallery. The Miami Canal is about 800 feet from the B&B Chemical Site. An NPDES discharge permit would be required and the treatment system's effluent would be monitored to ensure it complied with the appropriate NPDES discharge requirements. The discharged water would be required to meet ambient water quality criteria for protection of aquatic life, or State of Florida equivalent criteria, as opposed to MCLs.

Assuming three recovery wells, the estimated capital cost for this alternative is $2,341,100 and the annual O&M cost is $179,600. The total present worth cost for 10 years operation of this alternative is approximately $3,727,900.

7.5 ALTERNATIVE 5 - GROUNDWATER EXTRACTION AND OFFSITE DISCHARGE TO A PUBLICLY OWNED TREATMENT WORKS (POTW)

Alternative 5 involves extraction of the contaminated groundwater and discharging it to a local POTW. Because the contaminant concentrations are not extremely high, it is anticipated that the only limitations at the POTW would be due to hydraulic limitations. Depending on the industrial pretreatment standards required by the

POTW, this alternative allows the elimination of the physical and chemical treatment systems.

The water that is extracted from the site would have to be monitored to assure compliance with the POTW's industrial pre-treatment standards and any other requirements established by DERM and FDEP.

Assuming three recovery wells, the estimated capital cost for this alternative is $186,300 and the annual O&M cost is $150,100. The total present worth cost for 10 years operation of this alternative is approximately $1,345,300.

8.0 SUMMARY OF 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 major objective of the FS was to develop, screen, and evaluate alternatives for remediating the B&B Chemical Site. Several remedial technologies were identified for groundwater restoration. These technologies were screened, based on their feasibility with respect to the contaminants present and the site characteristics.

The technologies that remained after the initial screening were evaluated in detail. EPA has established nine criteria for evaluating potential remedial alternatives. A glossary of these evaluation criteria is provided in Table 6. These evaluation criteria have been divided into three groups based on the function of the criteria in remedy selection. The first two criteria on Table 6 are threshold criteria. These two criteria relate to statutory requirements that each alternative must satisfy in order to be eligible for selection. The next five criteria are balancing criteria. These are technical criteria upon which the detailed analysis is primarily based. The final two criteria on Table 6, known as modifying criteria, assess the public's and state agency's acceptance of the alternative. Based on these final two criteria, EPA may modify aspects of the specific alternative.

A summary of the relative performance of the alternatives with respect to each of the nine criteria is provided below. A comparison is made between each of the alternatives for achievement of a specific criterion.

8.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

All of the alternatives, with the exception of the No Action alternative, would provide protection of human health and the environment by eliminating or controlling exposure to contaminated groundwater through treatment or institutional controls. The No Action alternative fails to restrict exposure to the contaminated

TABLE 6

EVALUATION CRITERIA FOR REMEDIAL ALTERNATIVES
B&B CHEMICAL NPL SITE

Threshold Criteria

- o Overall Protection of Human Health and the Environment
- o Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Primary Balancing Criteria

- o Long-Term Effectiveness and Permanence
- o Reduction of Toxicity, Mobility, or Volume through Treatment
- o Short-Term Effectiveness
- o Implementability
- o Cost

Modifying Criteria

- o State Acceptance
- o Community Acceptance

soil and fails to monitor the progress towards natural attenuation. Alternative 2 relies on institutional controls and monitoring for protection until contaminant levels naturally attenuate to levels below the MCL. Alternatives 3 through 5 rely on institutional controls and treatment to eliminate exposure by actively remediating the groundwater.

8.2 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Under Section 121(d) of CERCLA, the remedial action at the B&B Chemical Site must comply with the federal and State of Florida environmental laws that are applicable or relevant and appropriate. Applicable requirements are those standards, criteria or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are those that, while not applicable, still address problems or situations sufficiently similar to those encountered at the site and that their use is well suited to the particular site.

Location-specific ARARs are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely on the basis of location. Action-specific ARARs are technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. Finally, chemical-specific ARARs are specific numerical restrictions on individually listed contaminants present in specific media. Examples of chemical-specific ARARs include the MCLs specified in the Safe Drinking Water Act, as well as the ambient water quality criteria contained in the Clean Water Act.

Although contaminants are expected to decline over time, the No Action alternative would not provide for any measures to verify eventual compliance with federal or State of Florida drinking water standards. Alternative 2 would rely on passive processes to comply with ARARs, so as to meet all MCLs in the site's groundwater and includes measures to verify compliance while protecting the population from exposure. Given the low contaminant concentrations in the site's groundwater, it is anticipated that natural attenuation will reduce these concentrations to below MCLs and therefore protect the environment. To verify that attenuation continues to occur, groundwater monitoring would be part of this alternative. All of the remaining actions will be designed and implemented so as to comply with all action- and location-specific ARARs. Groundwater recovery and treatment, conducted under Alternatives 3 through 5, would have to meet chemical-specific ARARs, through compliance with the groundwater protection standards (i.e., MCLs) and through compliance with NPDES permit conditions

for water recovered and treated at the site. Because the No Action alternative would not comply with the two primary criteria (Table 6), it will not be considered further in the analysis of alternatives.

With exception of the No Action alternative, monitoring is required in all the alternatives. This monitoring will provide the data necessary to verify that natural attenuation of contaminants is occurring or that treatment is effective. If it becomes apparent that MCLs will not be met through attenuation, EPA in consultation with FDEP, will re-evaluate the effectiveness of the remedy.

8.3 SHORT TERM EFFECTIVENESS

During the implementation of all the remaining alternatives, both onsite workers and people surrounding the site would be protected from possible impacts caused by construction activities, through the implementation of a health and safety plan. Alternatives 2 through 5 will require varying amounts of time to achieve the remediation goals. None will be immediately effective. Should a clearly defined groundwater plume require active restoration, Alternatives 3 through 5 would require the shortest time to be effective because under these alternatives, groundwater would be pumped from the aquifer for treatment, rather than relying on passive restoration.

8.4 LONG TERM EFFECTIVENESS AND PERMANENCE

With the exception of the No Action alternative, each alternative would be designed to meet federal of State of Florida MCLs. Although these alternatives would be capable of providing long term effectiveness, the alternatives do differ. Specifically, Alternative 2 would require reassessment, based on groundwater monitoring results and the actual effectiveness of institutional controls. Alternatives 3 through 5 would be designed to treat and reduce contaminant concentrations in the groundwater to the remediation goals. Once the remediation goals are reached, the site's groundwater would be monitored for two consecutive semi-annual rounds to insure the effectiveness of the remedy.

8.5 REDUCTION OF MOBILITY, TOXICITY OR VOLUME THROUGH TREATMENT

With the exception of the No Action alternative, the remaining alternatives would result in the reduction of toxicity, mobility and volume (TMV), to varying degrees. Alternative 2 would provide for passive, rather than active restoration of the groundwater. The basis for the belief that passive restoration will be effective at the B&B Site is the fact that contaminant concentrations have declined to near MCLs as a result of an estimated two years of groundwater pumping and treating, and that since active pumping and treating ended, a generally declining trend in contaminant concentrations has been observed.

The groundwater treatment contained as part of Alternatives 3 through 5 would satisfy the this criterion to a greater extent than

Alternative 2, as they provide for a reduction of TMV through the treatment of contaminated groundwater to drinking water standards. In the case of Alternative 5, contaminants would be removed from the aquifer, thereby reducing the mobility and volume of the plume. Treatment by the POTW would reduce the toxicity of any contaminants through dilution.

8.6 IMPLEMENTABILITY

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials. All of the alternatives, except Alternative 5, are technically and administratively feasible. Due to objections raised by the Wastewater Section of DERM, Alternative 5 is not administratively feasible.

8.7 COST

The present worth cost of each alternative given above includes the capital cost and annual O&M costs. With the exception of Alternative 2, which is estimated for five years, all estimated costs assume a ten year duration. There is no cost associated with the No Action alternative. The cost associated with Alternative 2 is exclusively those costs associated with semiannual groundwater monitoring. The cost associated with Alternatives 3 through 5 reflect design and construction of the recovery well system; however, Alternatives 3 and 4 also reflect costs associated with the construction and operation of the treatment systems. Alternative 3 includes cost associated with construction and operation of a groundwater injection or infiltration system. Alternative 4 includes cost associated with the construction of a discharge outfall line and NPDES monitoring. Alternative 5 includes POTW rates for treatment.

The present worth value represents the total cost of the various remedial alternatives expressed in today's dollars. These estimates are based on a 5% interest rate.

8.8 COMMUNITY ACCEPTANCE

EPA solicited public comments on the remedial alternative discussed in Section 7 of this document during the period of May 20, 1994 through June 20, 1994. The public meeting at which EPA presented the second Proposed Plan was attended by representatives of B&B Tritech, Inc. and one other interested party. Counsel for B&B Tritech, Inc. provided the only written comment received during the comment period (Appendix C). There is no indication that the public would not support the selected remedy.

8.9 STATE ACCEPTANCE

The State of Florida, as represented by the Department of Environmental Protection, has been the support agency during the Remedial Investigation and Feasibility Study process for the B&B Site. In accordance with 40 CFR 300.430, as the support agency,

FDEP, has provided input during the process. Based upon comments received from FDEP, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

9.0 SELECTED REMEDY

Based on Comparison of the alternatives in the FS and consideration of the requirements of CERCLA, the NCP, a detailed analysis of alternatives, EPA has selected Alternative 2 for the site. The selected alternative for the B&B Chemical Site is consistent with requirements of Section 121 of CERCLA and the NCP. Based on the information available at this time, the selected alternative represents the best balance among the criteria used to evaluate remedies. The selected alternative will verify that mobility, toxicity and volume of contaminated groundwater at the site is reduced. In addition, the selected alternative is protective of human health and the environment, will attain all federal and State of Florida ARARs, is cost-effective and utilizes permanent solutions to the maximum extent practicable.

The major elements of the selected remedy which address groundwater remediation are as follows:

o Natural attenuation of groundwater contaminants

o Source control

o Groundwater monitoring to confirm natural attenuation

9.A Natural Attenuation

Implementation of this alternative will include the natural attenuation of groundwater contaminants to levels below MCLs. It is expected that natural attenuation will occur within two years, based on the decreasing trends of groundwater contaminants observed during the 1992 through 1994 monitoring period.

9.B Source Control

The existing asphalt cover may be minimizing the leaching of soil contaminants into the groundwater by preventing the ready infiltration of rainfall through the vestiges of the former soakage pits, as well as other sources of groundwater contamination, documented by DERM and subsequently by EPA.

9.C Groundwater Monitoring

Since the Dade County Code currently restricts private party use of the Biscayne aquifer for potable purposes, groundwater use restrictions would be redundant. Groundwater monitoring will be implemented primarily to verify that natural attenuation is occurring. Groundwater monitoring will consist of semiannual sampling of the following monitoring wells at the site:

- o South-central well cluster (MWT-31, MWS-06 and MWD-07)
- o Southern cluster (CDM-02, CDM-03 and MWF-27)
- o Southeastern cluster (MWD-29 and MWM-29)

These wells, selected because of their historical exceedences of MCLs, will be sampled on a semiannual basis until the groundwater contaminants have decreased to levels below MCLs for two consecutive rounds of sampling. The wells to be monitored may be changed or increased in number if, groundwater monitoring shows contaminant concentrations to have risen significantly above the MCL. The final round of groundwater sampling will include all the monitoring wells associated with the site. Groundwater samples will be analyzed for the analytes on EPA's target compound, excluding semivolatile compounds, as these compounds have not been observed above MCLs in recent sampling rounds. The analytes on EPA's target analyte list will be used for inorganic analytes.

9.C.1 PERFORMANCE STANDARDS

The restoration of the aquifer will be monitored semiannually until the groundwater contaminants listed below have attained MCLs. The listed contaminants have exceeded MCLs during the 1992-1994 monitoring period. Performance standards for these analytes are as follows:

Vinyl chloride	1 ug/L
Benzene	1 ug/L
Chlorobenzene	100 ug/L
Chromium	100 ug/L

Performance standards are based on State of Florida MCL values. The promulgated State of Florida MCLs for vinyl chloride and benzene are more stringent than the federal MCLs. The major ARARs for this remedy include but are not limited to the Federal Safe Drinking Water Act (40 CFR Part 141) and the State of Florida Primary Drinking water Standards, FAC 17-550, which are relevant and appropriate.

9.C.2 COMPLIANCE TESTING

A groundwater compliance program will be developed to monitor the progress of the groundwater restoration. Groundwater samples will be analyzed to confirm that levels of the contaminants listed in Section 9.C.1 continue to decline and remain below MCLs. Should concentrations exceed MCLs or approach asymptotic levels before achieving ARARs, EPA, in consultation with FDEP, will reevaluate the effectiveness of the remedy and the need for further action. Regardless, monitoring will continue until contaminant concentrations are at or below MCLs for two consecutive semiannual sampling rounds.

10.0 STATUTORY DETERMINATIONS

The EPA has determined that this remedy will satisfy the statutory requirements of Section 121 of CERCLA by providing protection of human health and the environment, attaining ARARs, providing cost effectiveness, and utilizing permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The following sections discuss how the selected remedy meets these statutory requirements.

10.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy adequately protects human health by insuring that any potential future human exposure to the site's contaminated soil does not occur and by monitoring the contaminant levels in the Biscayne aquifer, found in excess of federal and State of Florida drinking water standards (MCL) during the 1992-1994 monitoring period, continue to naturally attenuate.

10.2 ATTAINMENT OF ARARs

Remedial actions performed under CERCLA, as amended by SARA, must comply with all ARARs or provide a justifiable waiver. The selected remedy for the B&B Site will comply with all federal and State of Florida ARARs and will not require a waiver.

Chemical-Specific ARARs

The performance standards for the indicator contaminants specified in Section 9.C.1 are based on federal and State of Florida MCLs. Federal and State of Florida MCLs are considered relevant and appropriate when determining acceptable exposure to groundwater. During the most recent round of sampling (January 1994), vinyl chloride was the only contaminant detected at a concentration above its MCL. The September 1992 through January 1994 groundwater sampling results showed vinyl chloride, benzene, chlorobenzene and chromium to have been present at concentrations above MCLS. If it becomes apparent that MCLs will not be met through natural attenuation, EPA, in consultation with FDEP, will reevaluate the effectiveness of this remedy.

Action-Specific ARARs

ARARs for groundwater use controls include FAC Chapter 17-524, "New Potable Water Well Permitting in Delineated Area". This State of Florida rule restricts installation of new wells in delineated areas of know contamination.

Location-Specific ARARs

Section 24-12(2)(Q) of the Dade County Code is an ARAR, since it prohibits the private use of groundwater wells in areas where a water main is available.

10.3 COST-EFFECTIVENESS

After evaluating all of the alternatives which satisfy the two threshold criteria, protection of human health and the environment and attainment of ARARs, EPA has concluded that the selected remedy, Alternative 2, affords the highest level of overall effectiveness proportional to its cost. Section 300.430(f)(1)(ii)(D) of the NCP also required EPA to evaluate three out of the five balancing criteria to determine overall effectiveness: long-term effectiveness and permanence; reduction of toxicity, mobility and volume through treatment, and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost-effective. The selected remedy provides for overall effectiveness in proportion to its cost.

The selected remedy has a relatively lower present worth, as compared to the treatment remedies, while satisfying the criteria for long-term effectiveness and permanence, as well as short-term effectiveness. This alternative would not reduce toxicity, mobility or volume through treatment; however, the reduction of toxicity, mobility and volume through natural attenuation would be monitored until ARARs are attained.

The estimated total present worth cost for the selected remedy is $92,400.

10.4 UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

EPA and FDEP have determined that the selected remedy provides the best balance among the nine evaluation criteria for the five alternatives evaluated. The selected remedy provides protection of human health and the environment, reduces the mobility of the plume, and is cost effective. The remedy, when complete, will be permanent.

The NCP Preamble, 55 FR 8734, states that natural attenuation is generally recommended only when active restoration is not practicable, cost effective or warranted because of site-specific conditions. The following factors were considered in determining that groundwater contaminants should decrease through natural attenuation: a) over 37 million gallons contaminated groundwater treated over a 24 month period, b) low levels of contaminant concentrations, and c) declining trends of contaminant concentrations, once active restoration ceased. Based on the declining trend in concentrations during the 1993-1994 monitoring period, EPA anticipates that contaminant concentrations in groundwater will be reduced to below performance standards within a reasonable timeframe.

10.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

The statutory preference for treatment is not satisfied by the selected remedy; however, natural attenuation utilizes a cost-effective method to address any residual threat to the groundwater.

Based on the limited area of the groundwater plume and the fact that the concentrations of groundwater contaminants present, relative to drinking water standards are low, EPA concluded that it was impracticable to treat the groundwater effectively. The remedial objectives of the selected remedy address the health and environmental threats at the site: ingestion of contaminated groundwater.

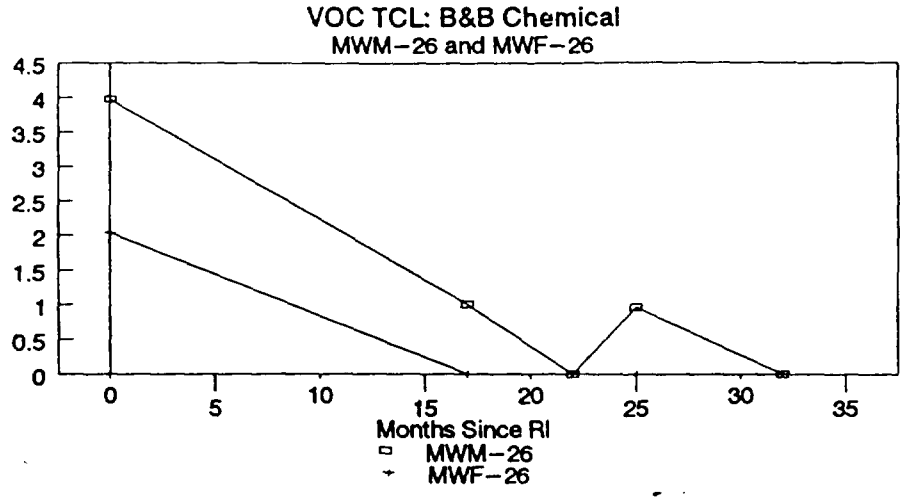
11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

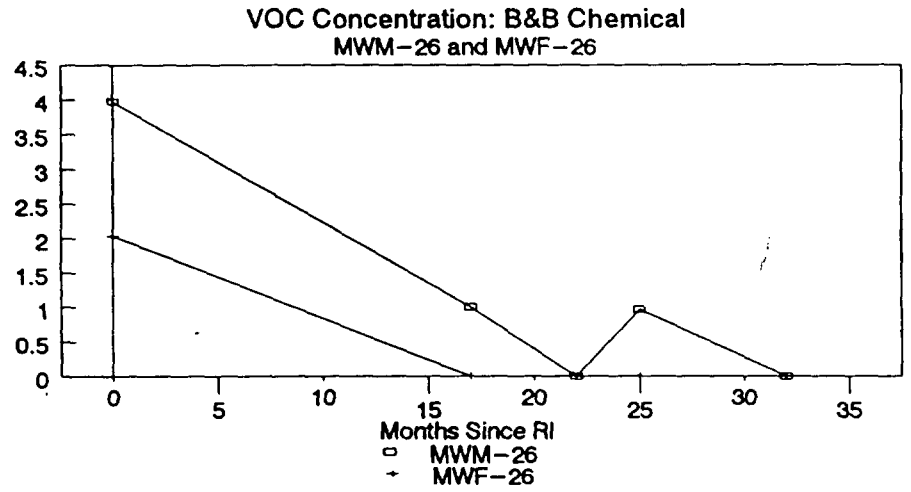
EPA issued a second Proposed Plan for remediation of the site in May 1994. The primary component of the selected remedy does not differ from the Proposed Plan in that natural attenuation is still the selected remedy. However, the May 1994 Proposed Plan presented institutional controls in the form of deed restrictions. Prior to the signature of the ROD, this component of the proposed remedy was modified to required institutional controls in the form of a notification agreement between EPA and the current landowner to insure the continued integrity of the existing asphalt cover.

APPENDIX A

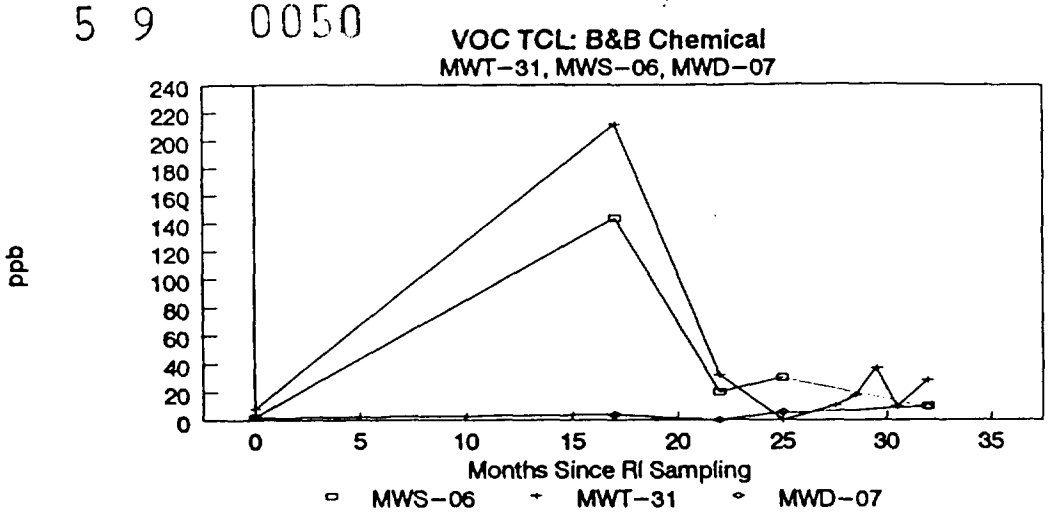
Appendix A presents graphical plots of total volatile organic compounds for the source-area, two downgradient and the background well clusters. The upper plot shows total target volatile organic compound concentrations over time. The lower plot shows total volatile organic compound concentration, including the miscellaneous purgeable compounds, over time. Note that the scale varies in the plots. The data plotted starts with the March 1991 remedial investigation data, followed by the September 1992, February 1993, May 1993 and January 1994 rounds of sampling. An exception to this is the plot for MWT-31. This well was sampled on four additional occasions during the fall of 1993.

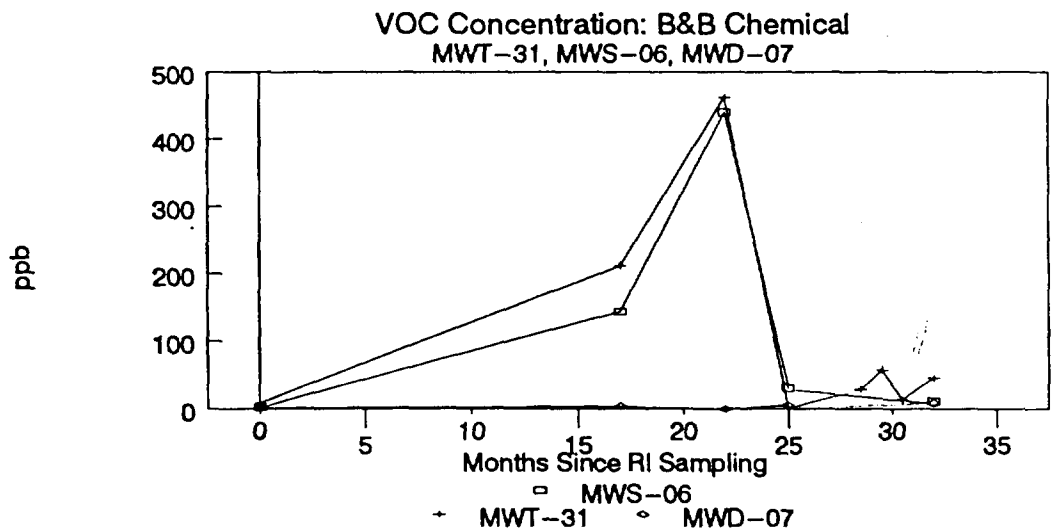
In addition, this appendix contains tables summarizing the groundwater analytical data for the B&B Site. Concentrations are in parts per billion.





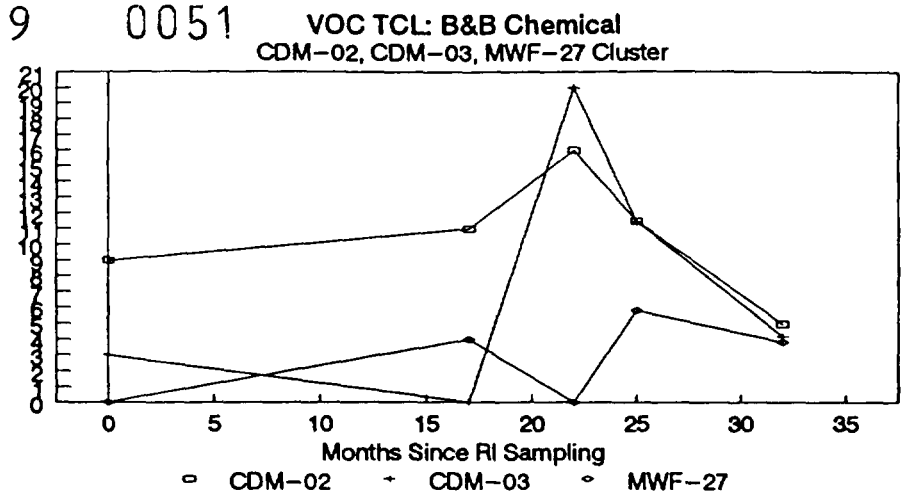
Background Wells

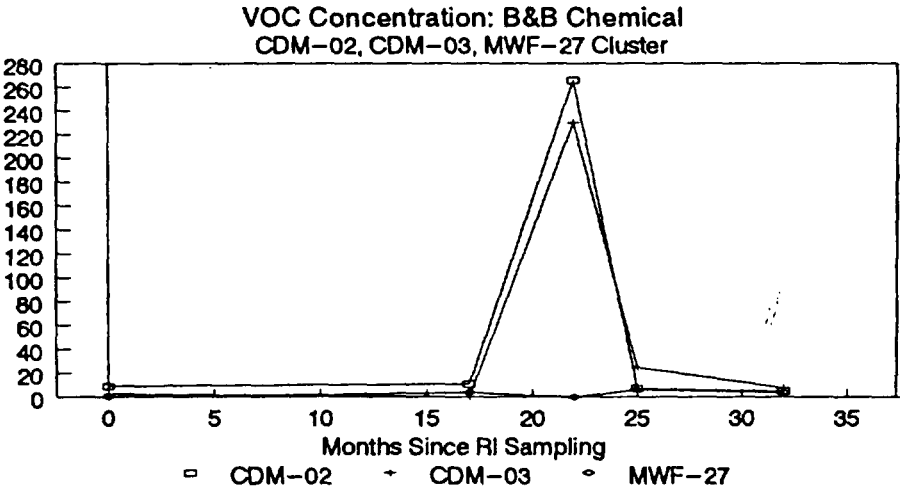




Source-area wells

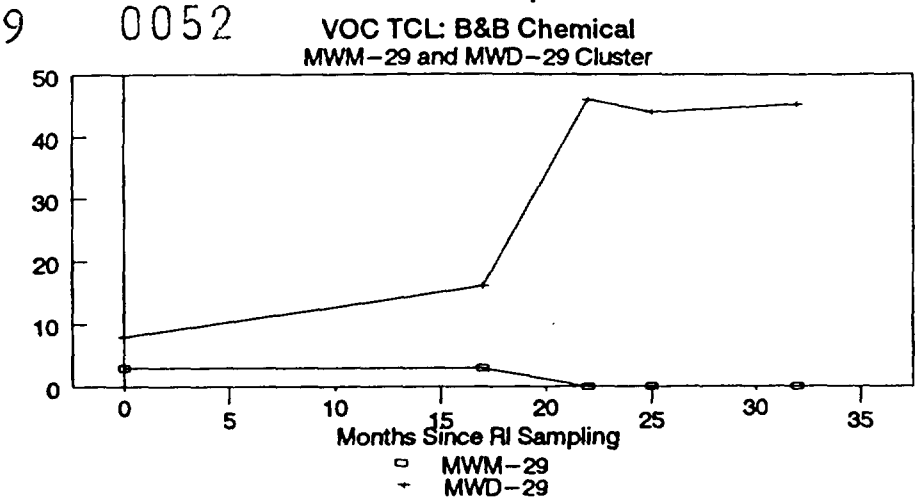
5 9 0051

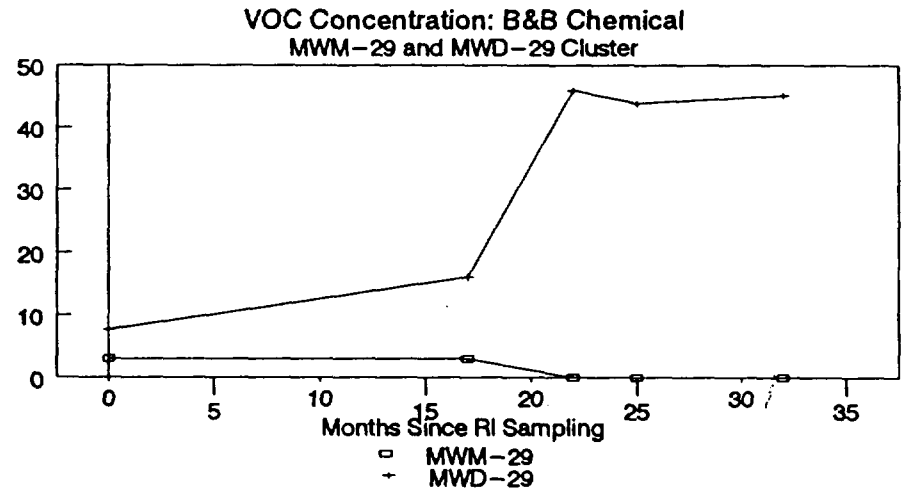




Downgradient wells

5 9 0052





Downgradient wells

BACKGROUND WELLS: OFFSITE

MWS-04 (7-17')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	U	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	20.0 JN	-	-	U	U

MWM-26 (25-35 ')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	U	U
Carbon Disulfide	1.5 J	U	U	U	U
1,2-Dichloroethene	U	1.0 J	U	U	U
Chloroform	1.0 J	U	U	U	U
cis-1,2-Dichloroethene	1.5 J	U	U	U	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	U	U	0.97 J	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	30.0 JN	-	-	U	U

MWF-26 (95-105')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	0.6 J	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	U	U	U	U
Chloroform	0.8 J	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	0.7 J	U	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	20.0	-	-	U	12.0
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	30.0 JN	-	-	20.0 JN	80.0 J

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

SHALLOW WELLS: ONSITE

MWS-12 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	1.0 J	U	U	-	U
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
Misc. Extractables	90.0 J	-	-	-	U

MWS-11 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	U	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	2.0 J	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	85.0	10.0	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	1.0 J	-	-	U	U
2-Methylnaphthalene	4.0 J	-	-	U	U
Misc. Extractables	230.0 JN	-	-	U	U

MWS-03 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	1.0 J	U	U	-	0.65 J
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
Misc. Extractables	U	-	-	-	U

MWS-05 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	U	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	0.87 J	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	3 J	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	U	-	-	U	U

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

SOUTH AREA CLUSTER: ONSITE

MWT-31 (5-8')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	9.0 J	U	U	U
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethane	U	6.0 J	U	U	U
1,2-Dichloroethene	U	41.0	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	3.6 J
Benzene	U	8.0 J	U	U	0.62 J
Toluene	U	8.0 J	U	U	U
Chlorobenzene	8.0	140.0	30.0	U	14.0
Xylene	U	U	2.0 J	U	0.63 J
Misc. Volatiles	U	U	430.0 JN	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	0.62 J
1,4-Dichlorobenzene	U	-	-	U	2.5 J
1,2-Dichlorobenzene	U	-	-	U	6.2
2-Methylnaphthalene	U	-	-	1.7 J	U
Naphthalene	U	-	-	8.2 J	U
Misc. Extractables	340.0	-	-	780.0 JN	1,960 JN

MWS-06 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	4.0 J	U	1.4 J	U
Carbon Disulfide	U	U	13.0	14.0	U
1,1-Dichloroethane	U	3.0 J	U	0.76 J	U
1,2-Dichloroethene	U	17.0	U	U	U
Chloroform	2.0 J	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	7.0	3.6 J
Benzene	U	3.0 J	U	U	U
Toluene	U	4.0 J	U	U	U
Chlorobenzene	U	110.0	7.0 J	4.4 J	6.3
Misc. Volatiles	U	3.0 JN	420.0 JN	0.77 J	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	1.0 J	U
1,2-Dichlorobenzene	U	-	-	1.4 J	U
Misc. Extractables	460.0 JN	-	-	220.0 JN	1,230 JN

MWD-07 (65-75')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	2.2 J	2.1 J
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	2.0 J	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	0.73 J	2.0 J
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	2.0 J	2.0 J	U	2.0 J	4.8 J
Misc. Volatiles	U	U	U	0.62 J	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	60.0 JN	-	-	U	40.0 J

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

SOUTH AREA CLUSTER: OFFSITE

CDM-02 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	1.6 J	U
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethane	U	U	2.0 J	U	U
1,2-Dichloroethene	U	1.0 J	14.0	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	0	4.9 J	U
Benzene	U/1.0 J	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	8.0 /U	10.0 J	U	4.2 J	4.4 J
Xylene	U	U	U	U	U
Misc. Volatiles	U	U	250.0 JN	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	4.0 J	-	-	U	1.6 J
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	0.79 J	0.56 J
2-Methylnaphthalene	3.0 J	-	-	U	U
Misc. Extractables	880.0 JN	-	-	90.0 JN	590 JN

CDM-03 (40-50')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U/3.0 J	U	14.0	0.70 J	U
Carbon Disulfide	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U
1,2-Dichloroethene	U	U	6.0 J	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	0.56 J	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U/2.0 J	U	U	8.0	1.7 J
Xylene	U	U	U	0.55 J	U
Misc. Volatiles	U	U	210.0 JN	13.52 J	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	0.72 J	1.0 J
1,2-Dichlorobenzene	U	-	-	0.91 J	1.5 J
2-Methylnaphthalene	U	-	-	2.2 J	1.8 J
Naphthalene	U	-	-	8.5 J	2.4 J
Misc. Extractables	U	-	-	280.0 JN	1,950 JN

MWF-27 (75-85')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	1.3 J	U	U	1.4 AJ	0.92 J
Carbon Disulfide	2.3 J	U	U	U	U
1,2-Dichloroethene	U	2.0 J	U	U	U
Chloroform	4.0 J	U	U	U	U
cis-1,2-Dichloroethene	1.8 J	U	U	0.73 J	U
Benzene	U	U	U	U	U
Toluene	1.2 J	U	U	U	U
Chlorobenzene	1.5 J	2.0 J	U	3.7 AJ	2.9 J
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
2-Methylnaphthalene	U	-	-	U	U
Misc. Extractables	U	-	-	U	U

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

SOUTHEASTERN AND SOUTHWESTERN CLUSTERS: OFFSITE

MWM-29 (25-35')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	U	U	U	U	U
Chloroform	3.0 J	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	U	3.0 J	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	18.0	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	U	-	-	U	U

MWD-29 (40-50')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	1.3 J	0.54 J
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	0.9 J	U	U	U	U
Chloroform	1.0 J	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	0.56 J	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	6.0	16.0	43.0	23.0	30.0
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	73.0	-	-	U	U
1,3-Dichlorobenzene	U	-	-	0.54 J	U
1,4-Dichlorobenzene	U	-	-	6.5	5.4
1,2-Dichlorobenzene	U	-	3.0 J	12.0	9.2
2-Methylnaphthalene	U	-	-	U	U
Misc. Extractables	10.0 JN	-	-	U	30 JN

MWM-28 (25-35')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	4.0 J	U	U	U
Carbon Disulfide	2.0 J	U	U	U	U
1,2-Dichloroethene	0.8 J	2.0 J	U	U	U
Chloroform	4.0 J	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	U	U	U	U	U
Toluene	1.0 J	U	U	U	U
Chlorobenzene	U	2.0 J	U	U	0.65 J
Misc. Volatiles	U	100.0 JN	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	U	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	2.0 J	-	U	U
Misc. Extractables	U	-	-	U	40 J

MWD-28 (40-50')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	3.0 J	3.0 J	U	U	U
Carbon Disulfide	U	U	U	U	U
1,2-Dichloroethene	0.6 J	1.0 J	U	U	U
Chloroform	U	U	U	U	U
cis-1,2-Dichloroethene	NA	U	U	U	U
Benzene	U	U	U	U	U
Toluene	U	U	U	U	U
Chlorobenzene	1.0 J	1.0 J	U	U	U
Misc. Volatiles	U	U	U	U	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	U	U
bis(2-ethylhexyl)phthalate	11.0	-	-	U	U
1,3-Dichlorobenzene	U	-	-	U	U
1,4-Dichlorobenzene	U	-	-	U	U
1,2-Dichlorobenzene	U	-	-	U	U
Misc. Extractables	20.0 JN			U	U

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

NORTHWESTERN CLUSTER: OFFSITE

MWT-35 (4-7')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,1-Dichloroethane	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	U	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	2.0 J	U	-	4.4 J
Xylene	U	U	U	-	U
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	0.56 J
2-Methylnaphthalene	U	-	-	-	U
Misc. Extractables	19.0 JN	-	-	-	U

MWD-02 (45-55')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,1-Dichloroethane	U	U	U	-	U
1,2-Dichloroethene	0.8 J	U	U	-	U
Chloroform	4.0 J	U	U	-	U
cis-1,2-Dichloroethene	U	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	2.0	U	U	-	1.7 J
Xylene	U	U	U	-	
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	38.0
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	1.0 J
1,2-Dichlorobenzene	U	-	-	-	1.5 J
2-Methylnaphthalene	U	-	-	-	U
Naphthalene	U	-	-	-	U
Misc. Extractables	U	-	-	-	U

MWS-01 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	0.92 J
Carbon Disulfide	U	U	23.0	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	U	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	U	U	-	2.9 J
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
2-Methylnaphthalene	U	-	-	-	U
Misc. Extractables	U	-	-	-	U

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WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

WESTERN AND SOUTHWESTERN CLUSTERS: OFFSITE

MWT-34 (4-7')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	U	U	-	U
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
Misc. Extractables	U	-	-	-	U

MWS-15 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	U	U	-	U
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
2-Methylnaphthalene	U	-	-	-	U
Misc. Extractables	30.0 JN	-	-	-	U

MWT-33 (4-7')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	U	U	-	0.65 J
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	-	-	-	-	U
bis(2-ethylhexyl)phthalate	-	-	-	-	U
1,3-Dichlorobenzene	-	-	-	-	U
1,4-Dichlorobenzene	-	-	-	-	U
1,2-Dichlorobenzene	-	-	-	-	U
Misc. Extractables	-	-	-	-	U

MWS-08 (10-20')

Volatile Compounds	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Vinyl Chloride	U	U	U	-	U
Carbon Disulfide	U	U	U	-	U
1,2-Dichloroethene	U	U	U	-	U
Chloroform	U	U	U	-	U
cis-1,2-Dichloroethene	NA	U	U	-	U
Benzene	U	U	U	-	U
Toluene	U	U	U	-	U
Chlorobenzene	U	U	U	-	U
Misc. Volatiles	U	U	U	-	U
Extractable Compounds					
bis(2-Chloroethyl) ether	U	-	-	-	U
bis(2-ethylhexyl)phthalate	U	-	-	-	U
1,3-Dichlorobenzene	U	-	-	-	U
1,4-Dichlorobenzene	U	-	-	-	U
1,2-Dichlorobenzene	U	-	-	-	U
Misc. Extractables	200.0 J			-	U

U: ANALYZED BUT NOT DETECTED
J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

SHALLOW WELLS: ONSITE

MWS-12 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	U
Chromium	27.0	8.0	U	-	U
Lead	17.0	6.0	U	-	U

MWS-11 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	U	22.0	U	U	U
Lead	6.0	17.0	U	U	U

BACKGROUND WELLS: OFFSITE

MWS-04 (7-17')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	5.0	U	U	U
Chromium	12.0	U	U	U	U
Lead	U	U	U	U	U

MWM-26 (25-35 ')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	6.4
Chromium	22.0	U	U	U	U
Lead	U	U	U	U	3.8

NORTH AREA CLUSTER: ONSITE

MWT-32 (4 - 7')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	U
Chromium	13.0	32.0	U	-	U
Lead	5.0	18.0	U	-	U

MWS-09 (10 - 20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	U
Chromium	U	U	U	-	U
Lead	8.0	U	U	-	U

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J: ESTIMATED VALUE
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

MWS-03 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	U
Chromium	U	U	U	-	U
Lead	U	U	U	-	U

MWS-05 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	U	U	U	U	U
Lead	U	U	U	U	U

MWF-26 (95-105')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	U	U	5.0 J	U	U
Lead	U	U	U	U	U

MWD-10 (45 - 55')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	10.0
Chromium	9.0	11.0	U	-	U
Lead	8.0 J	4.0	U	-	5.1

SOUTH AREA CLUSTER: ONSITE

MWT-31 (5-8')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	21.0	16.0	U	U	U
Lead	18.0	U	U	U	U

MWS-06 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	33.0	130.0	4.0 J	U	U
Lead	U	7.0	U	U	U

MWD-07 (65-75')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94	Apr-94
Cadmium	U	U	U	U	3.6	-
Chromium	19.0	45.0	230/190	16.0	510	U
Lead	6.0	6.0	U	U	4.6	-

SOUTH AREA CLUSTER: OFFSITE

CDM-02 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	55.0	210.0	U	U	U
Lead	8.0 J	U	U	U	U

CDM-03 (40-50')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	U	19.0	U	U	U
Lead	U	U	U	U	2.7

MWF-27 (75-85')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	3.0 J	U	U	U
Chromium	13.0	U	U	U	U
Lead	U	5.0	U	U	U

SOUTHEASTERN AND SOUTHWESTERN CLUSTERS: OFFSITE

MWM-29 (25-35')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	120.0	U	U	U	U
Lead	30.0 J	U	U	U	U

MWD-29 (40-50')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	55.0	27.0	U	U	U
Lead	4.0 J	U	U	U	U

MWM-28 (25-35')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	5.9
Chromium	4.0	4.0 J	6.0 J	U	U
Lead	U	U	U	U	3.8

MWD-28 (40-50')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	U	U
Chromium	58.0	9.0 J	U	U	U
Lead	5.0 J	U	U	U	U

U: ANALYZED BUT NOT DETECTED
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N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

NORTHWESTERN CLUSTER: OFFSITE

MWT-35 (4-7')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	U
Chromium	11.0	U	15.0 J	-	U
Lead	11.0 J	U	16.0 J	-	U

MWD-02 (45-55')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	9.0	U	U	-	3.6
Chromium	U	U	10.0 J	-	8.1
Lead	U	U	U	-	3.1

MWS-01 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	3.6
Chromium	U	U	U	-	U
Lead	U	4.0	U	-	U

WESTERN AND SOUTHWESTERN CLUSTERS: OFFSITE

MWT-34 (4-7')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	U	U	-	6.7
Chromium	U	4.0 J	U	-	U
Lead	U	U	U	-	U

MWS-15 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	6.0	U	U	-	U
Chromium	48.0	19.0	7.0	-	U
Lead	14.0 J	10.0	U	-	U

MWT-33 (4-7')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	5.0	19.0	U	-	U
Chromium	12.0	4.0	U	-	U
Lead	13.0	5.0	U	-	U

MWS-08 (10-20')

Metals Data	Mar-91	Sept-92	Feb-93	May-93	Jan-94
Cadmium	U	4.0 J	U	-	U
Chromium	U	U	U	-	U
Lead	14.0	U	U	-	U

U: ANALYZED BUT NOT DETECTED
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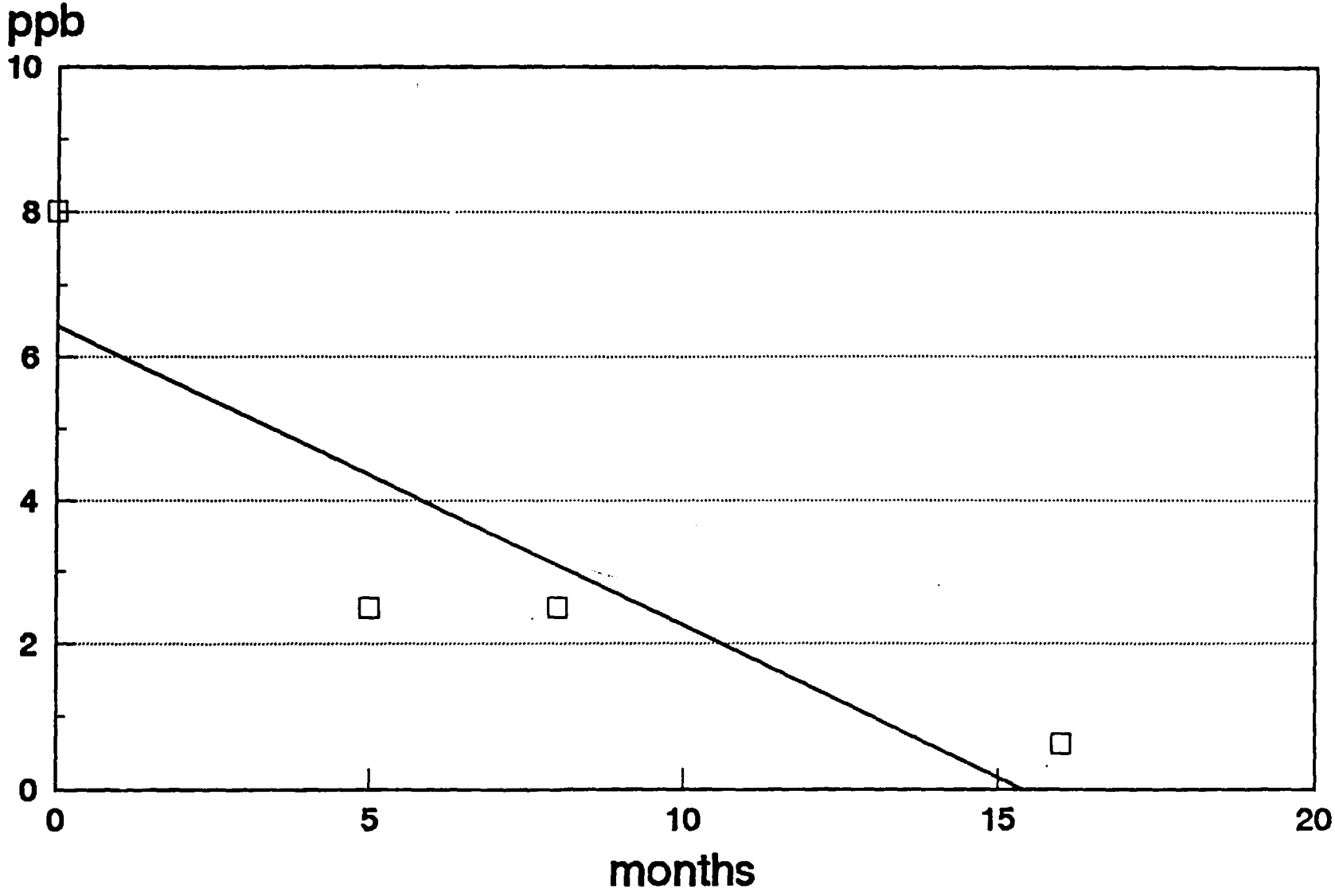
N: PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-: NOT SAMPLED OR NOT ANALYZED
WELL NAME IS FOLLOWED BY SCREENED INTERVAL, IN FEET BELOW LAND SURFACE

APPENDIX B

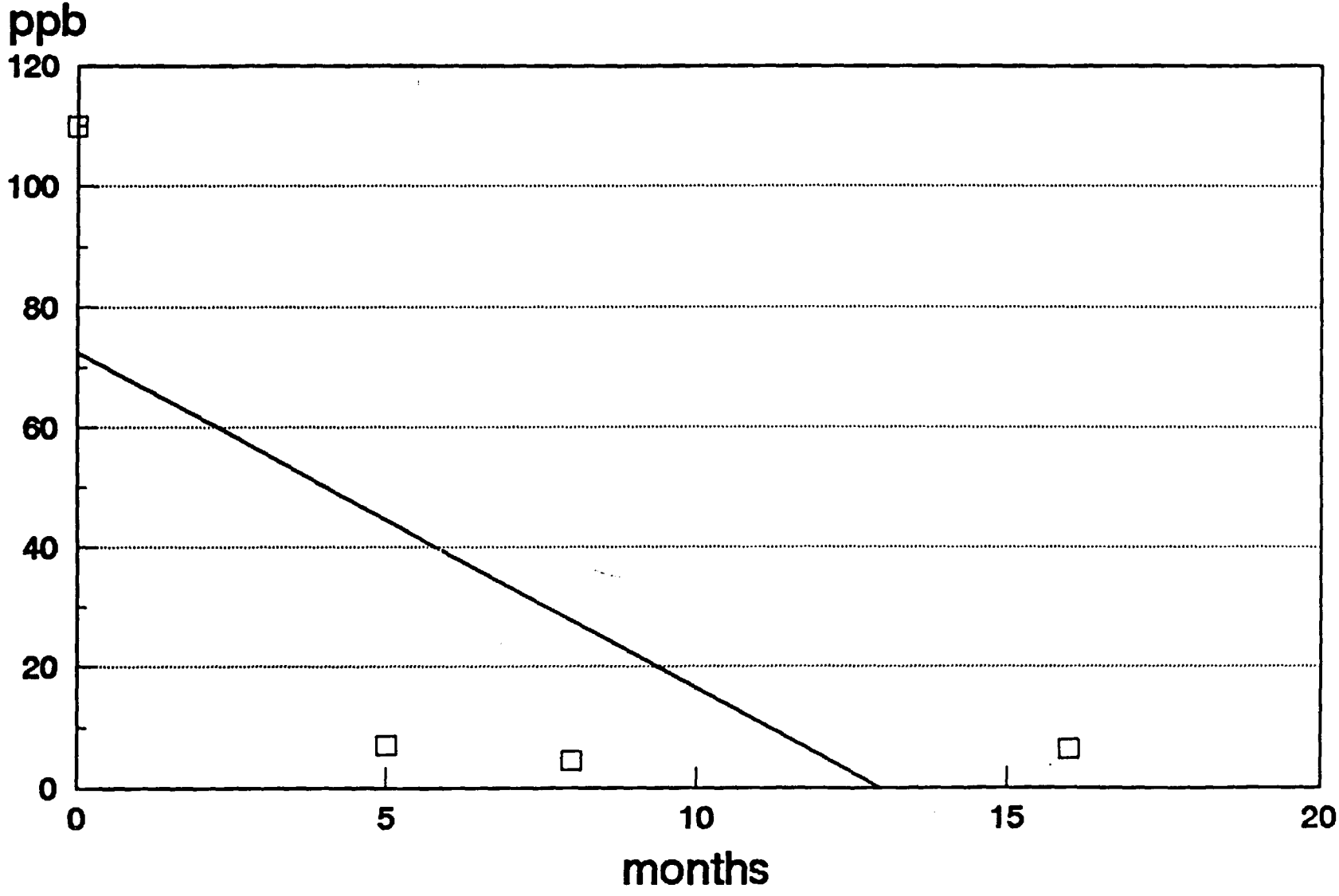
Appendix B shows linear regression curves for those analytes which exceeded State of Florida or federal maximum contaminant levels on at least two occasions during any of the groundwater sampling between September 1992 and January 1994. The data plotted is that for September 1992, February 1993, May 1993 and January 1994. When an analyte was found below detection limits, one half of the detection limit was used in the plot.

Two plots of the chromium data from well MWD-07 are presented. The plot with the decreasing slope omits the January 1994 data, discussed on page 18 of this document and includes the April 1994 data. The other plot uses the January and April 1994 chromium data.

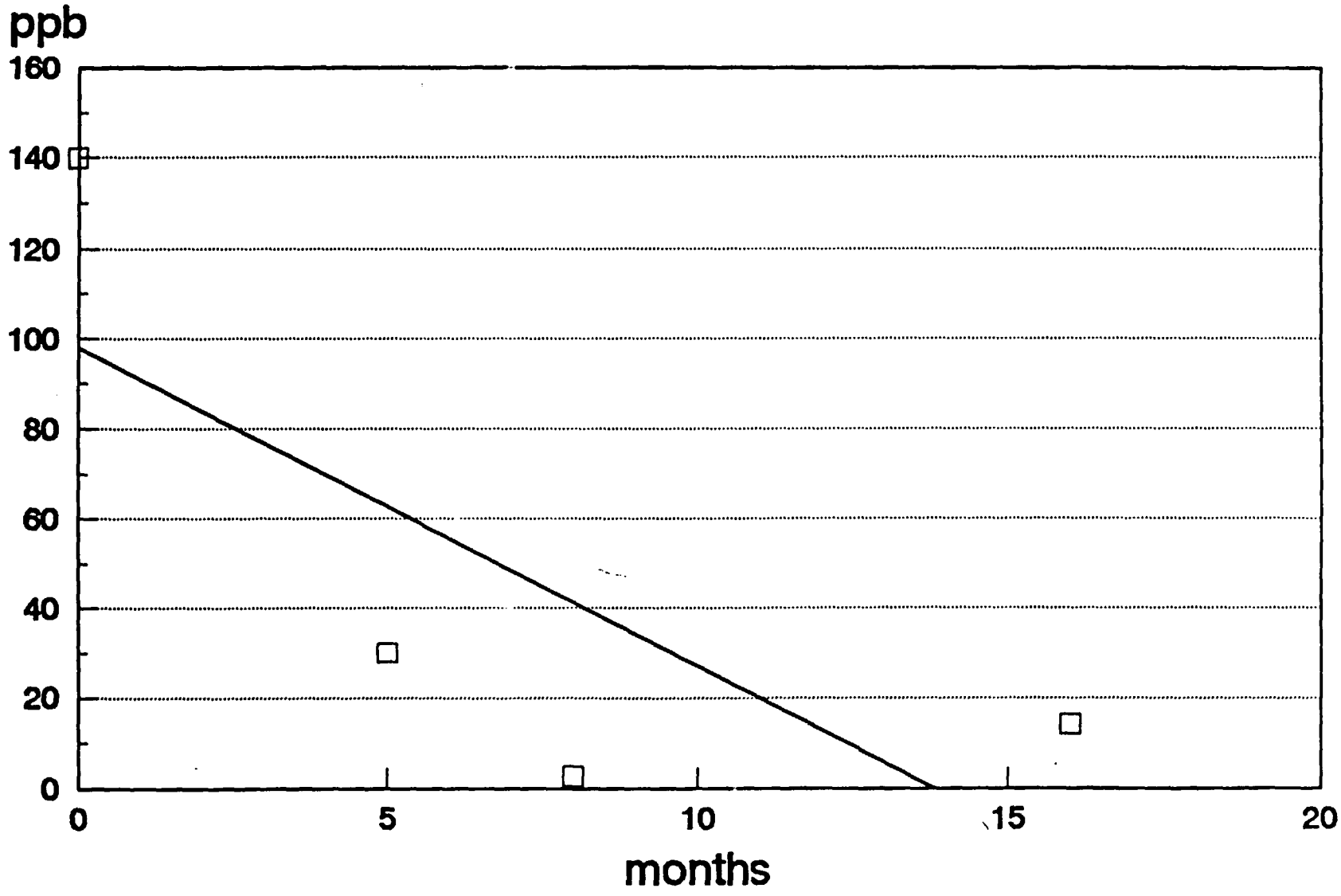
Benzene: MWT-31



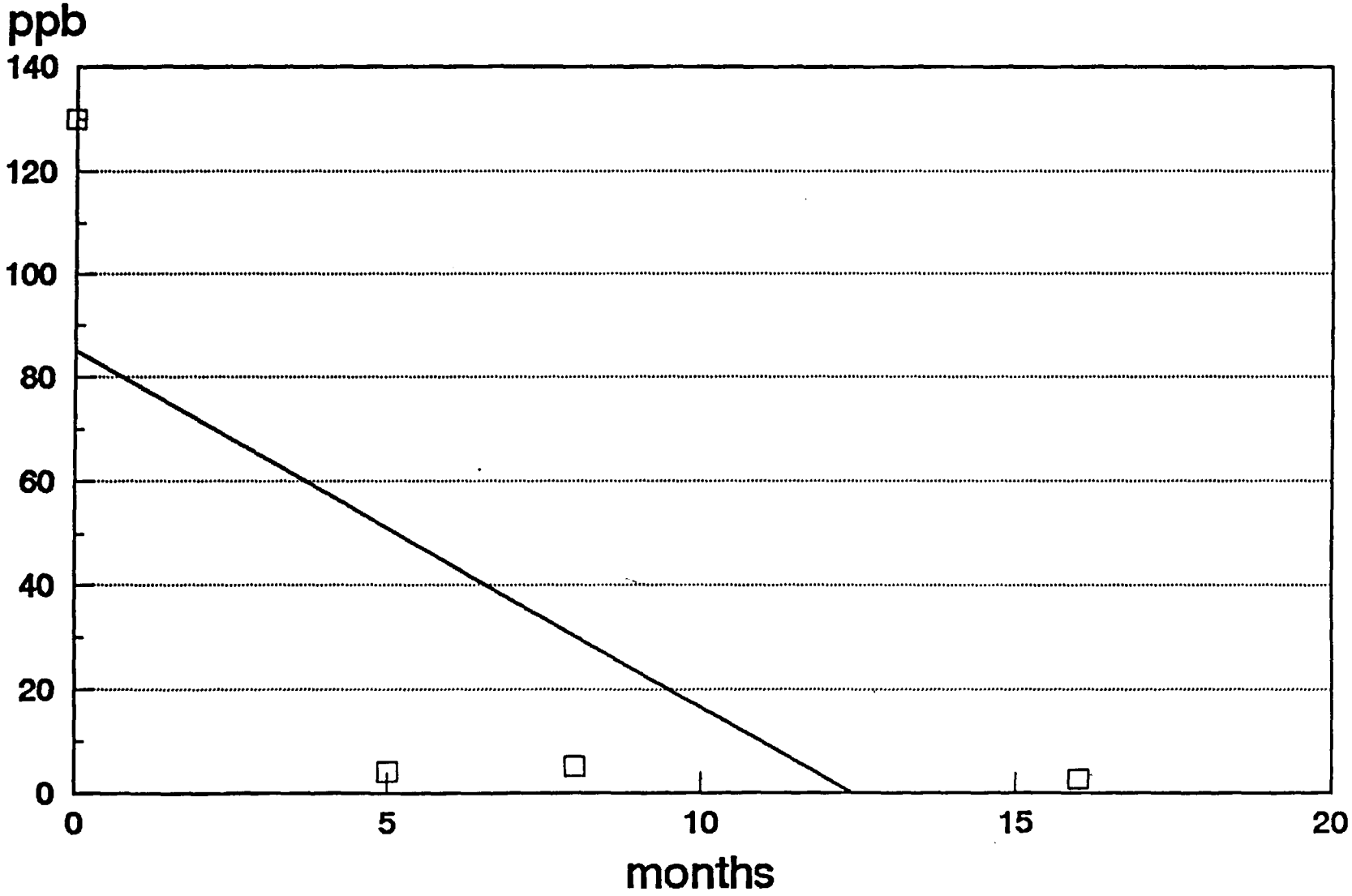
Chlorobenzene: MWS-06



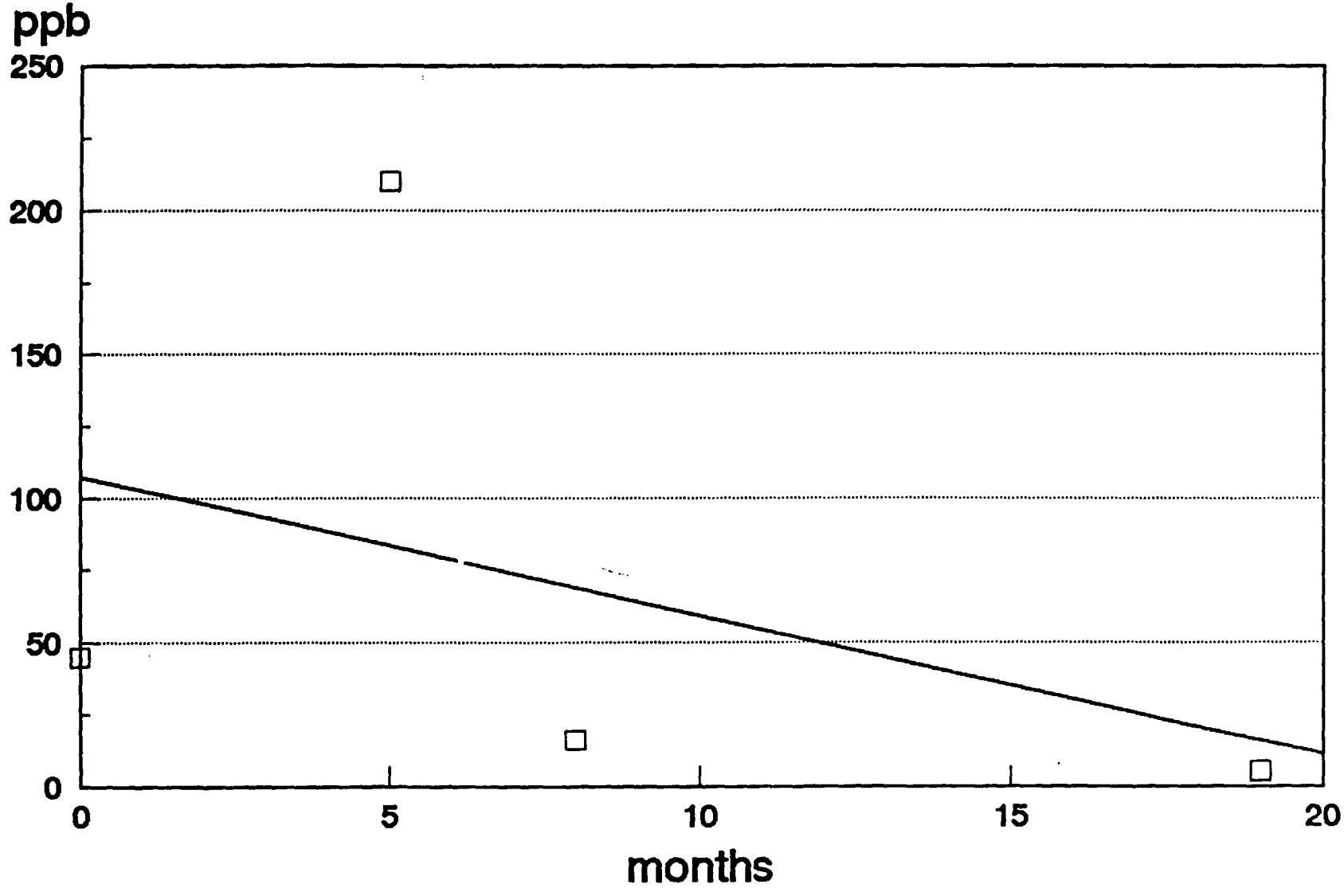
Chlorobenzene: MWT-31



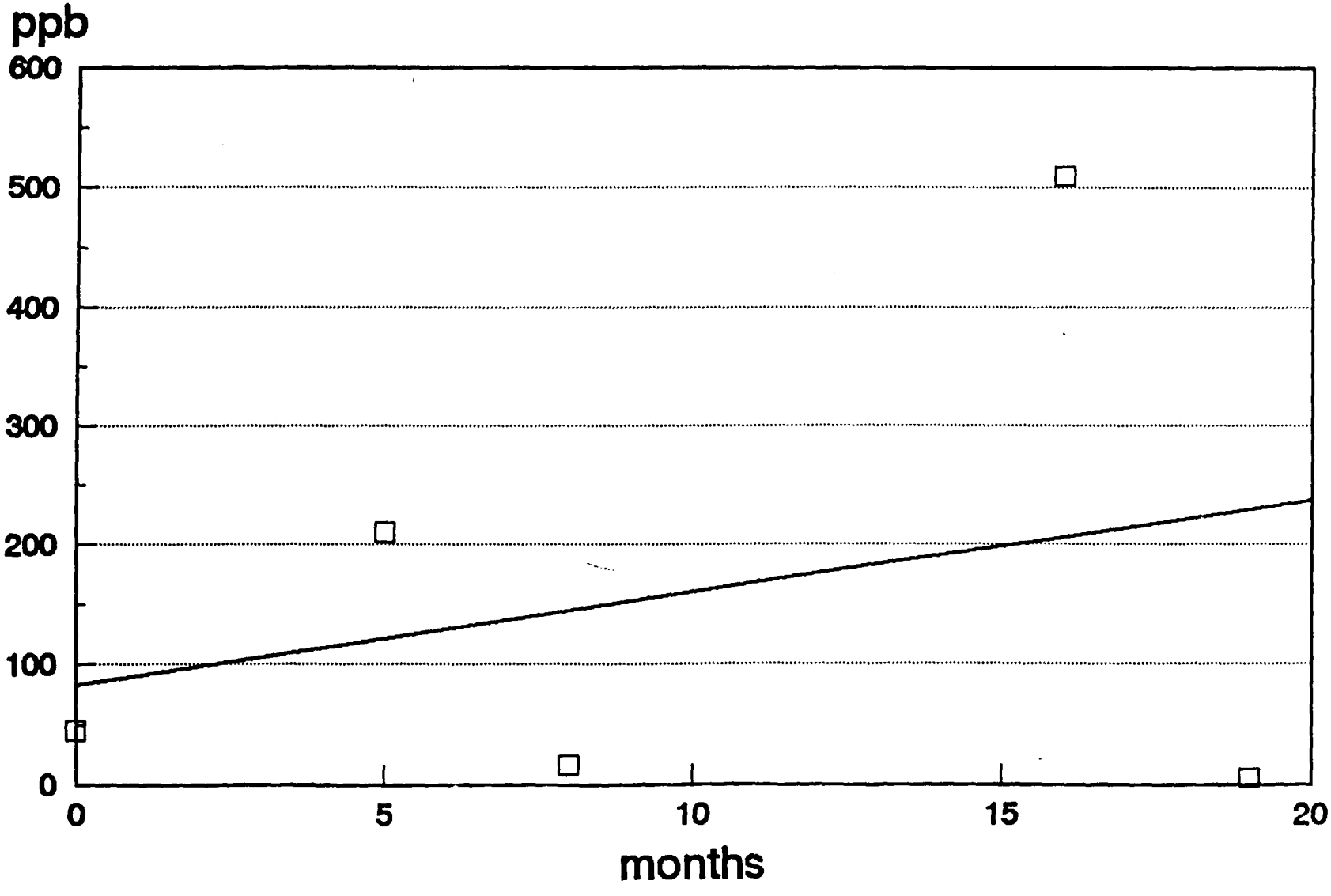
Chromium: MWS-06



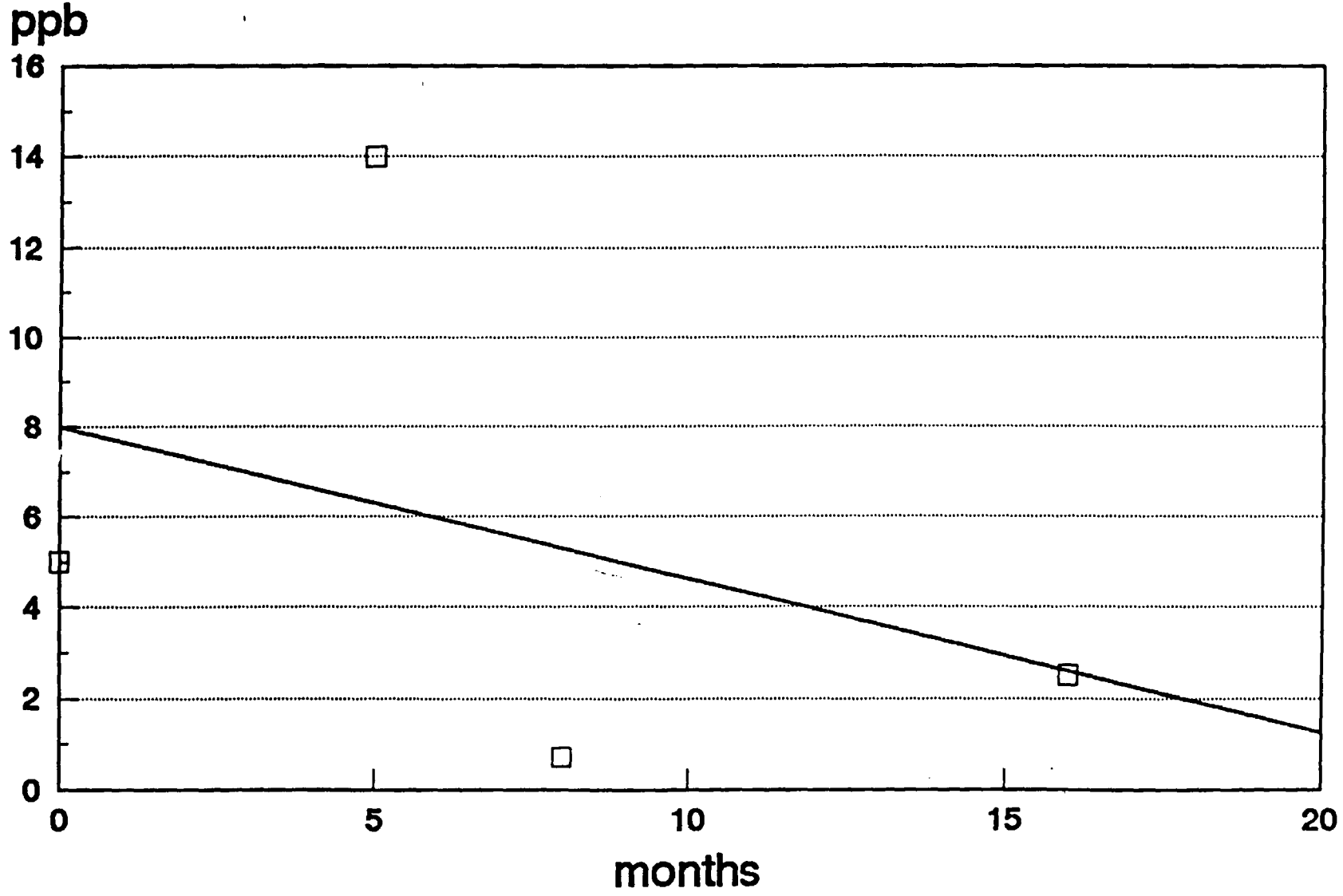
Chromium: MWD-07



Chromium: MWD-07



Vinyl Chloride: CDM-03



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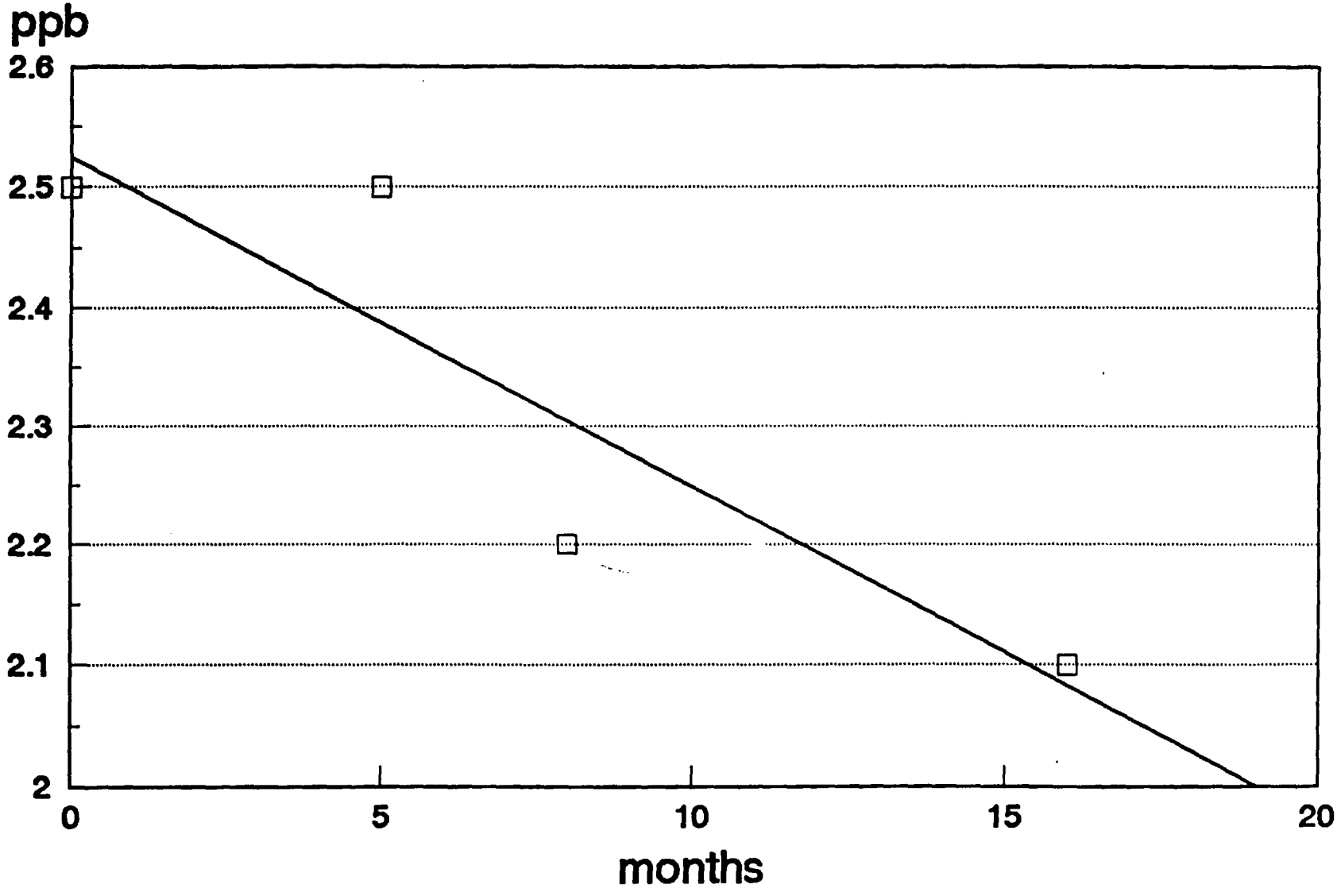

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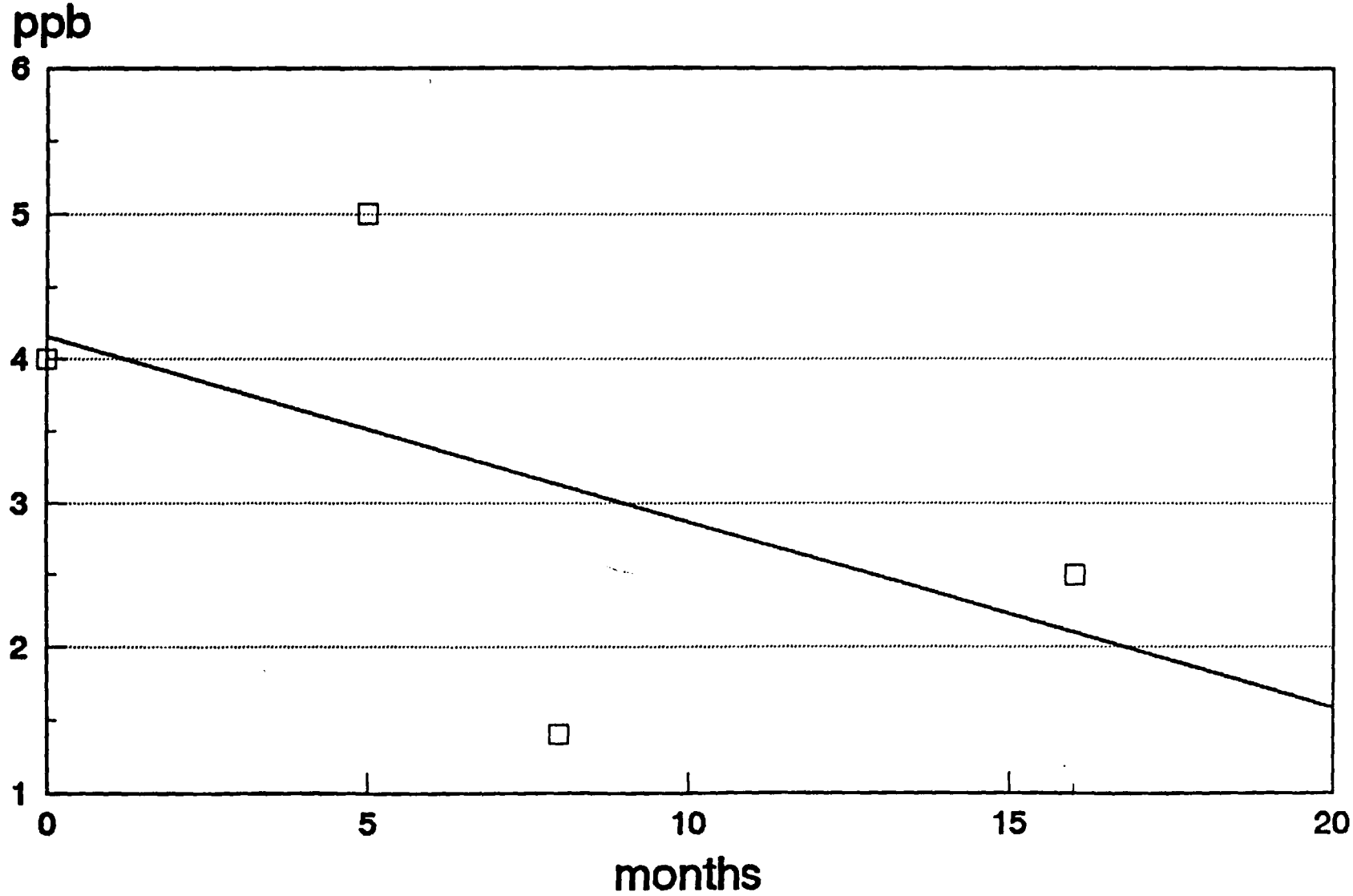

APPENDIX C

RESPONSIVENESS SUMMARY

Introduction

This responsiveness summary for the B&B Chemical National Priorities List Site documents for the public record, concerns and issues raised during the comment period for the 1994 Proposed Plan. EPA's responses to these concerns are included below.

Overview of the Comment Period

The second Proposed Plan for the B&B Site was issued on May 19, 1994. A thirty day public comment period for this Proposed Plan began on May 20, 1994 and ended on June 20, 1994. One written comment letter was received during the comment period. A public meeting was held on June 1, 1994 at the John F. Kennedy Library in Hialeah, Florida. A transcript of the meeting was prepared and is available at the site's information repository.

Concerns Raised During the Comment Period by Counsel to B&B Tritech, Inc.

1. The comment was made that the 1994 Proposed Plan falsely mentioned that B&B Chemical, Inc. declined to conduct an EPA-approved RI/FS.

Response:

The basis for EPA's noting in the 1994 Proposed Plan that B&B Chemical, Inc. declined to perform an EPA-approved RI/FS is the letter dated July 21, 1989 from counsel to B&B Chemical, Inc. In this letter, EPA is advised that B&B Chemical, Inc. would not sign a Consent Order for the Supplemental RI/FS at the B&B Site. This was subsequently confirmed by EPA in a letter directed to B&B Chemical's counsel, dated August 22, 1989.

2. The comment was made that EPA has incorrectly asserted that there existed soakage pits at the B&B Site. Further, the commenter observed that B&B has repeatedly requested that EPA look at aerial photographs and other documents which purportedly confirm that no soakage pits ever existed.

Response:

While the historical aerial photographs in EPA's files are at a scale (300 feet to the inch) such that the soakage pits would likely not be visible, there is ample evidence of the existence of these soakage pits. For example, the January 1975 DERM inspector's reports contain descriptions, sketches and photographs of the soakage pits and other sources of groundwater contamination, as well as analytical data obtained as a result of the DERM inspector's sampling of the contents of the pits. The preceding was mentioned by EPA at a January 1991 meeting attended by EPA representatives and their consultants, as well as consultants to B&B Chemical, Inc.

3. The commenter noted that the B&B Site should never have been placed on the NPL to begin with and given that there was a single exceedence of MCLs during the January 1994 sampling round, the site should be delisted.

Response:

EPA recognizes that groundwater contaminants have declined significantly since the start-up of pumping and treating of contaminated groundwater; however, as observed in the body of the ROD, the fact that contaminants are present in the subsurface soil and spiking of groundwater contaminant concentrations has occurred, EPA believed limited groundwater monitoring would insure that the site no longer poses a threat to the environment.

4. The commenter remarked that an expenditure of an additional $92,400, as estimated for the selected remedy, would be absurd and beyond belief.

Response:

As stated in the body of the ROD, the $92,400 cost for the selected remedy is for a five year period and provides ample margin, should MCLs not be attained in the projected two year time frame. Should MCLs be attained within the projected two year time frame, the cost would be 40% of that figure.

APPENDIX D

STATE OF FLORIDA CONCURRENCE LETTER