United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-91/155
September 1991

EPA

Superfund Record of Decision:

Fibers Public Supply Wells, PR

50272-11

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-91/155	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Fibers Public Supply Wells, PR
First Remedial Action - Final

5. Report Date 09/30/91

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered 800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 540-acre Fibers Public Supply Wells site is in Guayama, Puerto Rico. The site includes an active pharmaceutical plant (AWPI); two former manufacturing facilities, one of which encompasses two former settlement lagoons and a soil disposal area; and five public supply wells. Land use in the area is mixed agricultural and light industrial. The site overlies a class II aquifer. In addition, the Caribbean Sea is located 2 miles south of the site. From 1966 to 1976, Fibers International Corporation (FIC) manufactured nylon fibers onsite. From 1976 to 1980, Chevron Chemical Company (CCCPR) expanded the operations of the FIC plant to include the production of polypropylene fibers. Both FIC and CCCPR operations used organic solvents and degreasing solvents in their onsite process. Wastewater containing these solvents was directed to two settling lagoons, through the process sewer system for preliminary treatment, before being piped to an offsite biological treatment system. FIC lined the lagoons in 1969 to reduce the seepage of treatment wastewater. In 1978, CCCPR installed an onsite system for treating process and sanitary wastewater, and the treated effluent was directed to the settling lagoons before offsite discharge to the sea. CCCPR ceased onsite operations in 1980. State and

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Fibers Public Supply Wells, PR
First Remedial Action - Final
Contaminated Media: soil, debris, gw
Key Contaminants: VOCs (PCE, TCE), other organics, metals (chromium, lead), inorganics (asbestos)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 108
	20. Security Class (This Page) None	22. Price

EPA/ROD/R02-91/155
Fibers Public Supply Wells, PR
First Remedial Action - Final

Abstract (Continued)

private site investigations in 1983 revealed the presence of elevated levels of organics and inorganics in soil and ground water. Between 1984 and 1985, AWPI remodeled the facilities, and in 1985 began pharmaceutical manufacturing operations. Also in 1985, AWPI excavated portions of the settling lagoons and enlarged the stormwater retention pond to encompass the lagoon area. AWPI excavated 2,500 cubic yards of the lagoon sludge and asbestos-contaminated liner material, and deposited the material at an onsite soil disposal area. This Record of Decision (ROD) addresses a final remedy for source contamination in the soil disposal area and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including PCE and TCE; other organics; metals including chromium and lead; and other inorganics including asbestos.

The selected remedial action for this site includes excavating 9,010 cubic yards of contaminated material from the soil disposal area and transporting the soil offsite to a landfill authorized to accept asbestos; conducting soil sampling; controlling dust during remediation to prevent exposure and to protect workers and the local community during the transportation of asbestos-containing material (ACM); restoring and covering the excavated area with 6 inches of fill and 6 inches of top soil, followed by revegetating the area; onsite pumping and treatment of the 200-acre contaminated ground water plume from five recovery wells using filtration and air stripping, and discharging the treated water onsite to a nearby irrigation canal to recharge the aquifer; and installing monitoring wells near the coastline to monitor potential salt water encroachment. The estimated present worth cost for this remedial action is $6,686,591, which includes an annual O&M cost of $270,868 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil goals for asbestos are based on NESHAPs under the CAA, which consider that materials containing asbestos in concentrations exceeding 1 percent be regarded as ACM Ground water clean-up goals are based on State and Federal MCLs. Goals for soil include asbestos 1 percent by volume. Chemical-specific ground water goals include PCE 0.005 mg/l (MCL) and TCE 0.005 mg/l (MCL). EPA may invoke an ARAR waiver for ground water if the remediation program indicates that reaching MCLs in the aquifer is technically impracticable.

ROD FACT SHEET

SITE

Name:	Fibers Public Supply Wells Site
Location/State:	Guayama, Puerto Rico
HRS Score:	35.34
NPL Rank:	406

ROD

Date Signed:	September 30, 1991
Remedy:	Aquifer restoration by pumping five production wells, air stripping volatile organics, and discharge to an irrigation canal. Excavation with off-site disposal of asbestos-contaminated soils pile.
Capital Cost:	$ 2,522,684
O&M/Year:	$ 270,868
Present Worth (10 years)	$ 3,383,256
Present Worth (30 years)	$ 5,455,591

LEAD

Responsible parties:	Phillips Petroleum Company, Chevron Chemical Company, and American Home Products
Primary Contact:	Adalberto Bosque, (809) 729-6951
PRP Contact:	Frank H. Crum (813) 968-5882

WASTE

Type:	Volatile organics in groundwater and asbestos in soils.
Medium:	Groundwater and soils
Origin:	The volatiles originated from a wastewater settling pond and the asbestos from the pond liner which was excavated.
Estimated Quantity:	200-acre groundwater plume and 9,000 cu. yds.

DECLARATION FOR RECORD OF DECISION

SITE NAME AND LOCATION

Fibers Public Supply Wells Site, Guayama, Puerto Rico

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Fibers Public Supply Wells Site ("Site") in Guayama, Puerto Rico, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site.

The Puerto Rico Environmental Quality Board (EQB) concurs with the selected remedy. A letter of concurrence from EQB is appended to this document. The information supporting this remedial action decision is contained in the Administrative Record for this Site, the index of which is also appended.

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The remedial alternative presented in this document is the only operable unit for the site. It focuses on groundwater contamination as well as soil contamination.

The major components of the selected remedy include the following:

- Contaminated groundwater will be pumped from five recovery wells at a combined flow rate of approximately 1,400 gpm. However, the actual pumping rate will be determined during the Remedial Design (RD).

- The treated groundwater will be discharged to the PREPA irrigation canal where it will also serve to recharge the aquifer unless it is determined during the RD stage that a more appropriate option exists for all or portions of the treated groundwater. In any event, the method of discharge must provide a beneficial use of the water.

- Sediment/particulate filtration and air stripping will be installed to remove Volatile Organic Compounds (VOCs).

- A long-term monitoring program will be implemented to track the migration and concentrations of the contaminants of concern and assess performance of the groundwater extraction wells.

- Chloride monitoring wells will be installed near the coastline to monitor potential salt water movement.

- A system monitoring program will be implemented which includes the collection and monthly analysis of influent and effluent from the air stripping tower and periodic collection of well-head samples.

- EPA may invoke a technical waiver of the ARARs if the remediation program indicates that reaching Maximum Contaminant Levels (MCLs) in the aquifer is technically impracticable.

- The Soil Disposal Area will be excavated and the contaminated soils will be transported to an authorized landfill for disposal.

- Dust control and worker health and safety measures will be taken throughout the excavation process.

- The Soil Disposal Area would be restored once excavation activites are completed.

DECLARATION OF STATUTORY DETERMINIATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action (ARARs) and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. This remedy satisfies the statutory preference for remedies that employ treatment that reduce the toxicity, mobility, or volume of contamination as their principal element for the groundwater. However, since treatment of the excavated soil was not found to be practicable, the remedy for the soil Disposal Area does not satisfy the statutory preference for treatment as a principal element of this aspect of the remedy. Because this alternative will result in contaminants remaining on Site above health based limits, CERCLA requires that this action be reviewed at least once every five years, to ensure that the remedy continues to provide adequate protection.

Constantine Sidamon-Eristoff
Regional Administrator

9/30/91
Date

DECISION SUMMARY

FIBERS PUBLIC SUPPLY WELLS SITE

GUAYAMA, PUERTO RICO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK

TABLE OF CONTENTS

I. Site Location and Description

The Fibers Public Supply Wells Site ("Site") is located in the municipality of Guayama, approximately 2 miles north of the Caribbean Sea on the south coast of Puerto Rico. The Site is located on Route 3 approximately 1.6 kilometers southwest of the Town of Guayama, Puerto Rico (Figure 1). The area of investigation for the Remedial Investigation (RI) (study area) shown on Figure 2, encompasses about 540 acres, and includes a former synthetic fibers manufacturing plant, five public-supply wells owned and operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA), the Anaquest Caribe, Inc. facility and adjacent areas. As noted in Figure 2, the plant, which is presently operated by Ayerst-Wyeth Pharmaceutical, Inc. (AWPI), and the Anaquest facility are located on the north side of Route No. 3, and the wells are located on the south side.

The Site is surrounded by agricultural land, an electrical substation, a government correction facility, and a refinery. The PRASA wells are located about 2 miles north of the south coast of Puerto Rico. The population of Guayama in 1980 was about 41,000.

The permanent population in the vicinity of the study area is small. Along the eastern boundary of the study area (identified as the Reunion Area), six dwellings associated with sugar cane operations house approximately twenty residents. Outside the study area to the south, along the coastal road (identified as the Las Mareas Area), the dwellings also house approximately twenty residents.

In the late 1960s and early 1970s, the Fibers International Corporation/Chevron Chemical Company (FIC/CCCPR) facility and the Phillips Puerto Rico Core, Inc. facility were the only industrial operations in the area. A Puerto Rico Department of Corrections facility was constructed in the mid 1970s. In the early 1980s, the facilities of Anaquest Caribe, Inc. and Smith, Kline and Beecham (SK&B) Laboratories were constructed at or near the Site. The current work force at the three manufacturing facilities within the study area is approximately 1200 and the prison is currently being expanded to house a population of about 600. The current work force at the Core facility is approximately 350. Construction of a new pharmaceutical facility by Whitehall Laboratories has recently been completed.

Two principal geological formations are present in the study area: alluvium and bedrock. The bedrock consist of on-the-site volcanic breccia and lava, volcanic-derived sandstone and siltstone. The groundwater is contained in both the alluvial deposits and the underlying bedrock in the creek. Groundwater flow in the study area is to the south and southeast. Groundwater within the vicinity of the study area is recharged from stream flow, rainfall and irrigation return flow. The

Guamani River, which is located approximately .5 miles in the easterly direction, is often dry. Examination of topographic contours indicates that superficial (overland) flow of surface water from the Site is controlled by a series of drainage ditches which direct the surface flow to the west, away from the river. About 5 percent of the annual rainfall recharges the aquifer and about 30 to 50 percent of irrigation water percolates back to the aquifer.

II. Site History and Enforcement Activities

The manufacture of nylon fibers was initiated by FIC in November 1966 and continued until February 1976. Phillips was the majority stockholder of FIC. The property on which the plant was constructed and operated was, and remains, owned by the Puerto Rican Government (P.R. Southern Industrial Development Co. a wholly owned subsidiary of Puerto Rico Industrial Development Corpany). In February 1976, CCCPR, a subsidiary of Chevron, purchased the facilities (not including the real property) which were later expanded to include the production of polypropylene fibers. Manufacturing by CCCPR continued until October 1980. The facilities were subsequently remodeled by AWPI and the pharmaceutical operations began in 1985.

Based on a review of company records and employee interviews, FIC and CCCPR operations included the purchase and use of solvents containing tetrachloroethylene (PCE), trichloroethylene, (TCE) and other organic chemicals. Degreasing solvents were also used to clean the spinning machinery. Wastewater containing these solvents was directed to two settling lagoons located near the southwestern corner of the plant property through the process sewer system. The piping of this sewer system failed an integrity test and was replaced by AWPI. The lagoons were lined by FIC in 1969 to reduce the seepage of wastewater from the unlined lagoons. The two lagoons provided settlement as the preliminary treatment of the wastewater generated at the plant. This water was subsequently piped to an off-site biological treatment system located at the Phillips Core Plant.

CCCPR completed installation of an on-site wastewater treatment system for process and sanitary wastewater in July 1978. Treated effluent from this new system was diverted to the settling lagoons prior to discharge to the sea under a National Pollutant Discharge Elimination System (NPDES) permit. CCCPR ceased operations in October 1980.

The five PRASA wells which are located south of P.R. Route No. 3 were constructed in 1966 to provide drinking water to the residents of the Salinas-Guayama area and were constructed prior to the initiation of manufacturing at the FIC facility. The wells average about 125 feet in depth and 12-inches in diameter.

In 1976, citizens using the public supply system in the vicinity of the study area complained that the water had a bad taste and odor. PRASA sampled Well No. 3 and as result of detecting contamination, pumped Well No. 3 for about a week in an attempt to clear the well. This attempt was unsuccessful as the water continued to have odor and taste problems, and PRASA Well No. 3 was subsequently removed from service.

Water samples obtained by the United States Geological Survey (USGS) in June 1982 and in January and February 1983, indicated that water from PRASA Well No. 2 contained three organic compounds above detection limits. The PRASA Wells were sampled by the United States Environmental Protection Agency (EPA) contractor, NUS Corporation (NUS), in January and February 1983. Volatile organics were found in four of the wells at concentrations up to 2100 ppb and subsequently PRASA Well Nos. 2, 4 and 5 were removed from service. PRASA Well No. 1, which was found to be uncontaminated, continues to produce potable water for use in the PRASA system. Phillips Core and SK&B Laboratories have wells for industrial use within the plume area. AWPI also pumps the aquifer outside the plume area for industrial and potable uses.

On September 1, 1984, the Site was placed on the National Priorities List, established under Section 105(a)(8)(b) of CERCLA 42 U.S.C. §9605(a)(8)(B).

When AWPI obtained the lease for the plant in 1984, two wastewater settling lagoons existed near the stormwater retention pond. Prior to the acquisition of the facility by AWPI, the lagoons were settling ponds for wastewaters containing waste chemicals, including, but not limited to, tetrachloroethene (ethenes are also known as ethylenes) and trichloroethene.

In May and June of 1985, AWPI excavated portions of the lagoons and enlarged the stormwater retention pond to encompass the lagoon area. Asbestos fibers were a component of the liner under both wastewater lagoons. This liner material was excavated together with the sludge that had settled to the bottom of the lagoons. The excavated soil/sludge material was then deposited at the Soil Disposal Area (SDA) in the northwest section of the AWPI plant Site. The SDA is approximately 1.4 acres in size with a reported average soil/sludge depth of approximately 1 foot. A total of approximately 2500 cubic yards of soil and sludge were excavated and deposited on the land surface at the disposal area.

In December 1985, Phillips Petroleum Company and Chevron Chemical Company entered into an Administrative Order on Consent with EPA, pursuant to the authority of Section 106 of CERCLA, 42 U.S.C. §9606, in which they agreed to undertake a Remedial Investigation/Feasibility Study ("RI/FS") of the Site. The reports submitted pursuant to the Order determined the extent of

contamination at the Site and identified the appropriate remedial alternatives.

In September 1986, American Home Products Corporation (AHP), parent company of AWPI, entered into an Administrative Order on Consent with EPA, pursuant to the authority of Section 3013 of RCRA, 42 U.S.C. §6934. Under the Administrative Order, AHP agreed to conduct monitoring, testing and analysis at the SDA to determine the presence of contamination in that area. Following the detection of metals, phenol, cyanide and the PCB isomer Aroclor 1260 in the soil samples collected in 1987 from the SDA, negotiations for a second Administrative Order under CERCLA were initiated.

In September 1989, AHP entered into a new Administrative Order on Consent with the EPA pursuant to the authority of Sections 104 and 122 of CERCLA, 42 U.S.C. §§9604, 9622. Pursuant to such Order, AHP agreed to conduct additional monitoring, testing and analysis to ascertain the nature and extent of contamination caused by the excavation of the two lagoons and relocation of the contents of the lagoons. Analyses revealed the presence of chromium and asbestos in the SDA. Pursuant to the Order, AHP agreed to cooperate with Phillips and Chevron in the formulation of the FS for the entire Site.

In October of 1990, Anaquest Caribe Inc. advised EPA that Anaquest's products, Isoflurane and Enflurane, hazardous substances pursuant to CERCLA, which belong to the halogenated ether family were, detected in SK&B wells at a concentration of up to 786 ppb. In addition, these hazardous subtances were detected in Anaquest wells aproximatelly 100 feet from the study area, in the same aquifer in which the solvents were detected.

In October 1990 and November 1990, the Remedial Investigation Report (RI) and the Modified Remedial Investigation Report (MRI), respectively, were provided to EPA. Approval of those reports was granted by EPA.

All of the above referred to parties have been identified as Potentially Responsible Parties (PRP's). In addition, the Puerto Rico Industrial Development Company (PRIDCO) has been identified as a PRP through its ownership of the property on which AWPI is located.

III. Highlights of Community Participation

The RI/FS Report and the Proposed Plan for the Fibers Public Supply Wells Site were released to the public for comment on July 23, 1991. These two documents were made available to the public in both the Administrative Record and information repositories maintained at the EPA Docket Room in the Region II New York City office, the EPA Caribbean Field Office, and at the Town of

Guayama Municipal Library located at Derkes Street West End, Guayama, Puerto Rico. The notices of availability for these documents were published in the El Nuevo Dia Newspaper on July 23, 1991 as well as in the San Juan Star Newspaper on July 25, 1991. A public comment period was held from July 23, 1991 through August 21, 1991. In addition, based on a request for extension of time, thirty additional days were granted up to September 20, 1991. The notice for the extension of time was published in the El Nuevo Dia Newspaper on August 21, 1991. A public meeting was held on August 6, 1991 at the Municipal Assembly Room in Guayama, Puerto Rico. At this meeting, representatives from EPA presented the findings of the RI/FS and answered questions from the public about the Site and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is appended to this ROD.

IV. Scope and Role of Operable Unit or Response Action Within Site Strategy

EPA has separated the response actions at the Site into two different areas. Those areas include groundwater contaminated with volatile organics above MCLs and the SDA which contains asbestos and metals. The remedial action described in this ROD will address both areas. The goal of the remedial action for the SDA is to remove the contaminant mass to prevent any current or future health risk.

The ultimate goal of the EPA Superfund approach to groundwater remediation as stated in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP) is to return usable groundwater to their beneficial uses within a time frame that is reasonable. The goal of this remedial action is to halt the spread of the groundwater contaminant plume and return usable groundwater to beneficial uses within a time frame that is reasonable. However, EPA recognizes that the selected remedy may not achieve this goal because of the technical difficulties associated with treating contaminants to groundwater cleanup levels. The result of this remedial action will be monitored carefully to determine the feasibility of achieving this final goal. This remedial action will permit the further collection of data on the aquifer without delaying initial remediation measures.

EPA's Superfund Program uses EPA's GroundWater Protection Strategy as guidance when determining the appropriate remediation for contaminated groundwater at CERCLA sites. The GroundWater Protection Strategy establishes different degrees of protection for groundwater based on their vulnerability, use, and value. For the aquifer at the Fibers Site, which is classified by EPA as a Class II aquifer, the final remediation goals will be Federal Safe Drinking Water MCLs. Class II aquifers include current and

potential sources of drinking water and groudwater potentially available for drinking water, agriculture, or other beneficial use.

V. Summary of Site Characteristics

A. Site Geology and Hydrology

Surficial soils in the study area consist primarily of silty loam, silty clay loam, and loam and are classified by the U.S. Department of Agriculture and the Bureau of Chemistry and Soils, University of Puerto Rico, as San Anton soils.

The geology of the study area consists of alluvial deposits underlain by bedrock. The alluvial deposits consist of clays, silts, and sands containing small to medium sized gravel and larger broken and weathered bedrock boulders in a clay and silt matrix. The bedrock underlying the alluvium is a blue andesite.

The aquifer underlying the site, which is classified as a Class II aquifer, acts as a single artesian aquifer contained within the alluvium and includes the upper weathered portion of the bedrock underlying the alluvium. The artesian aquifer is overlain throughout the study area by a series of clays, which act as a semi-confining unit at the top, and by bedrock at the bottom. The groundwater flow through the bedrock formation is restricted to the fractures of the otherwise nonporous rock and is not considered an aquifer within the vicinity of the study area. Four hydrogeologic units are described for the site:

1. Sands and silts to depths of 10 to 40 feet (thicker to the south).
2. Clays and sandy clays (semi-confining unit) ranging in thickness from about 10 to 20 feet. (Perched water was observed in some of the RI soil borings above this unit.)
3. Alluvial aquifer ranging from 50 to 100 feet thick.
4. Bedrock

The USGS (Torres-Gonzalez, 1987) described the first unit (perched water zone) as a shallow water-table zone that is relatively permeable but is not sufficiently thick to provide the amounts of groundwater required by agriculture and established industries in the area.

The general permeability of the entire aquifer is approximately 30 feet/day. Based on measurements taken during the RI, groundwater flows to the south/southeast at a calculated flow velocity of 3 feet/day. However, groundwater flow within the study area is influenced by industrial well pumping at the SK&B and Phillips-Core facilities. Analyses of the geologic cross sections of the study area indicate that, under natural

conditions, groundwater may flow in a more southwesterly direction.

B. Nature and Extent of the Contamination

1. Groundwater

The groundwater quality of the aquifer underlying and downgradient of the Site was assessed by two rounds of water quality sampling in 1987 and a third round of sampling in 1990. Tables 1 through 3 present the results of the analyses of groundwater samples from the PRASA, monitoring, and private/ industrial wells, during the three RI sampling rounds and the MRI of the SDA.

The following halogenated alkane/alkene compounds are hazardous substances pursuant to CERCLA and are also the principal organic contaminants detected during the RI groundwater monitoring program.

- Tetrachloroethene
- Trichloroethene
- 1,2-Dichloroethene
- 1,1,2,2-Tetrachloroethane
- Vinyl Chloride
- Carbon Tetrachloride
- Trichlorofluoromethane

Tetrachloroethene (PCE), a hazardous substance, pursuant to CERCLA, was the principal organic contaminant detected in the groundwater underlying and downgradient of the Site. The concentrations detected ranged from an estimate of 0.5 ppb to 240 ppb, 48 times the proposed MCL. Figures 3 and 4 display the PCE contaminant plume based on round 2 and round 3 data. As noted in these figures the approximate extent of the plume is 200 acres. The settling lagoons and sections of the process wastewater piping system represent the most probable pathway for contaminants to have entered the groundwater.

Elevated metal concentrations were detected in unfiltered groundwater samples collected from several RI monitoring wells and PRASA Well No. 5. Existing or proposed MCLs were exceeded for arsenic, barium, cadmium, and chromium, in unfiltered groundwater samples. Unfiltered samples collected on round 3 for PRASA well number 5 do not exceed MCLs. The monitoring wells that were sampled in the initial two rounds of sampling were subjected to limited periods of pumping and the water collected from the majority of the wells was turbid and contained significant particulate matter. This may be the cause of the higher metal concentrations on the unfiltered samples. Metal concentrations in the filtered groundwater samples do not exceed MCLs.

The occurrence and distribution of contamination demonstrated by the analytical results of the RI and MRI sampling effort indicate that migration through environmental media is occurring. The major fate and transport mechanisms affecting the VOCs at the Site are summarized in Table 4.

2. Soils and Sediments

Sediment samples were collected from the former wastewater settling lagoons and the former stormwater retention area. A total of six sediment samples were collected. The locations of the sediment samples are identified in Figure 5. These samples were analyzed for VOCs, metals and pesticide organics (including PCBs). Table 5 is a summary of metals analyses of the sediment samples and Table 6 indicates PCBs detected in the sediment samples. PCE was not detected in any of the sediment samples. However, a few VOCs were detected in some samples at low concentrations.

Site-related organic contaminants such as tetrachloroethene and trichloroethene were detected in the deep soil borings advanced in the vicinity of the former lagoons. According to field gas chromatography (GC) results, the maximum levels of PCE and TCE detected were 65 mg/kg and 67 mg/kg, respectively. Other volatile organic contaminants (methylene chloride, 1,2-dichloroethene, chloroform) were detected in less than 2 percent of the soil samples analyzed using the field GC. Site-related volatile organic contaminants were not detected in the shallow boring samples.

Summaries of soil boring results in the wastewater lagoons and the SDA are presented in Tables 5 and 7 respectively. Chromium contamination (maximum concentration = 2,110 ppm) was detected in surface soils and sludges collected at the SDA and wastewater lagoons. Besides chromium and cadmium, other metals were not detected at concentrations significantly above background. PCBs and asbestos were detected in several shallow composite borings at the 2 to 4 foot depth in the SDA. PCBs were (maximum concentration = 1.7 ppm) detected in the SDA soil samples. Asbestos was detected in several soil samples collected at the SDA. The concentrations detected (2 to 4 percent) renders the soil asbestos-containing material, pursuant to NESHAPs regulations.

Air monitoring conducted during the MRI indicates that metals and VOC concentrations detected downwind of the SDA are similar to concentrations detected upwind of the SDA.

VI. Summary of Site Risks

EPA conducted a Risk Assessment of the "no-action" alternative to evaluate the potential risks to human health and the environment

associated with the Site in its current state. All the contaminants identified above detection limits in the sampling of environmental media at the Site were selected as contaminants of concern. The contaminants of concern and their indices of toxicity are listed in Table 8.

EPA's Risk Assessment identified several potential exposure pathways by which the public may be exposed to contaminant releases from the Fibers site under a current land-use scenario. In addition, the potential future risks associated with use of contaminated groundwater use were evaluated. The actual and potential pathways and populations potentially affected are shown in Table 9.

The potential exposure routes identified in the Risk Assessment include:

- exposure to contaminants from ingestion, inhalation and dermal contact of contaminated surface soils at the SDA.

- ingestion, inhalation and dermal contact exposure to metals and organic compounds from contaminated groundwater beneath the Site as a source of potable water.

The potentially exposed populations in all cases were the residents (adults and children) of the neighborhoods surrounding the Site and industrial workers within the study area.

The Risk Assessment evaluated the maximum and average contaminant concentrations detected in the environmental media at the Fibers Site. Additionally, the upper (95 percent) confidence limit on the arithmetic average for third round groundwater result was evaluated.

Table 10 presents the maximum and average concentration of PCE in the PRASA wells, monitoring wells, and private/industrial wells. Table 11 presents the range and average concentration detected for the other chlorinated alkane/alkene compounds. Table 7 presents the soil boring analytical summary for the SDA. Asbestos was detected in several soil samples collected at the SDA. The concentration detected (2 to 4 percent) renders the soil as asbestos-containing material pursuant to NESHAPs regulations.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and non-carcinogenic effects due to exposure to Site chemicals are considered separately. It was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, carcinogenic and non-carcinogenic risks associated with exposures to individuals were summed to indicate the potential risks associated with mixtures of potential carcinogens and non-carcinogens, respectively.

Non-carcinogenic risks were assessed using a hazard index ("HI") approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligram per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared with the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media. A HI greater than 1 indicates that the potential exists for non-carcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The HIs for the potential ground water exposures at the Fibers Site are presented in Table 12. The HI calculated for a resident using maximum organic contaminant levels in all groundwater wells exceeds unity (HI = 12.5). The total HI values for all ground-water contaminants is when maximum contaminant levels are evaluated.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by the EPA for the compounds of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogen Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. For known or suspected carcinogens, EPA considers excess upper bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable with 10^{-6} being the point of departure. This level indicates that an individual has not greater than a one in ten thousand to one in a million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the Site.

The cancer risk levels for ground water exposures are presented in Table 13. The cumulative upper bound risk for adult residents using contaminated ground water is 2×10^{-3}, greater than EPA's acceptable cancer risk range.

Risk analysis results for the SDA and lagoon soils indicate that adverse non-carcinogenic health effects are not anticipated for site workers or adolescent trespassers.

Asbestos was detected in several soil samples collected at the SDA. The concentration detected (2 to 4 percent) renders the soil as asbestos - containing material, pursuant to NESHAPs. These asbestos concentrations in soils present a potential public health concern.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis uncertainty can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

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

VII. Description of Alternatives

The Superfund law requires that any remedy selected for a Site must be protective of human health and the environment, cost-effective, and in accordance with statutory requirements. Permanent solutions to contamination are to be achieved wherever possible, and there is a bias for treating wastes and applying innovative technologies. The remedial alternatives considered for the Site are summarized below.

The time to implement refers only to the actual construction time and excludes the time needed to design the remedy and negotiate with the Potentially Responsible Parties.

Alternatives for the Contaminated Groundwater

Alternative 1 - No Action

The Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") requires that the "No Action" alternative be considered at every Site to provide a baseline of comparison among alternatives. The No Action alternative assumes no additional actions would be taken beyond the current activities at the Site. All wells that are currently pumping are assumed to continue to pump at their current rates. The costs for the No Action alternative are as follows:

Capital Cost	$0
Annual O&M	$0
10-year Present Worth	$0
30-year Present Worth	$0

In accordance with Section 121 of CERCLA, remedial actions that leave hazardous substances at the Site are to be reviewed at least once every five years to assure that the remedial action is protective of human health and the environment. The No Action alternative would have to be reviewed by EPA at least once every five years.

Alternative 2 - Deed Restrictions with Monitoring

This alternative involves registering deed restrictions to limit the land use activities at the entire affected Site as well as periodic groundwater monitoring to track the movement and concentration of the VOCs. Groundwater use restrictions would be implemented in the affected area in an attempt to prevent the use of contaminated groundwater. These institutional controls would alert future property owners to potential Site related risks. Deed and groundwater restrictions would be implemented by Commonwealth and local officials. As the owners of record, the deed restrictions would have to be filed by the Land Authority and the Puerto Rico Industrial Development Company (PRIDCO).

PRASA wells would have to remain closed. Annual sampling of eight monitoring wells would provide assessments of the extent and mobility of the VOC's. Six of the monitoring wells would be located within the PCE plume and two monitoring wells would be located downgradient of the PCE plume. Annual status reports would be filed with the appropriate regulatory agencies. The costs for this alternative are as follows:

Capital Cost	$89,000
Annual O&M	$14,000
10-year Present Worth	$196,000
30-year Present Worth	$303,000

This alternative has the same aquifer cleanup effectiveness as Alternative 1.

Because this alternative would result in contaminants remaining on Site, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 3 - Groundwater Extraction and Treatment with Surface Water Discharge

This alternative was evaluated at two different flow rates, each flow rate targeted to a different level of groundwater remediation. Alternative 3-I is evaluated assuming that 300 gpm is pumped from one recovery well located in the most concentrated area of the plume. Alternatives 3-II and 3-III evaluated assuming that a total of 1,400 gpm is pumped from five recovery wells located throughout the areal extent of the plume. However, actual pumping rates will be determined during the remedial design. Air releases from the treatment system would comply with air emission standards pursuant to the Clean Air Act and P.R laws and regulations.

Deed restrictions and well construction controls would attempt to restrict the installation of water supply wells and limit the use of groundwater in the area during the implementation phase for Alternatives 3, 3-I 3-II, and 3-III. These restrictions would also alert future property owners of potential site related risks.

Alternative 3-I - Extraction Well and Treatment with Discharge to the Caribbean Sea

Contaminated groundwater would be pumped from PRASA Well No. 3, which is in the center and most contaminated portion of the plume, at a flow of 300 gpm. The pump and associated equipment currently installed in PRASA Well No. 3 would be removed. The well would be cleaned and redeveloped to ensure that the required yield is available and the discharge is clean and relatively free of sediment. A new pump would be installed along with the

associated pipes and fittings. The discharge would be directed to a pipe leading to the treatment system. The connection to the existing PRASA distribution pipe would be capped and secured. The well house would be repaired and a chain link fence would be installed around the well house for security. Preliminary design calculations included as Appendix F of the FS report, indicate that the tower would be 5 feet in diameter and have 5.5 feet of packing material. The overall height of the tower is estimated at 9 feet. The process diagram of this alternative is shown on Figure 6. The water would flow under pressure, through a sediment filter, to remove particulates originally present in the groundwater or created by the subsequent aeration, then to a packed tower for aeration. The effluent from the tower would flow into a sump from which it would be pumped through piping to discharge at the channel leading to the Caribbean Sea as shown in Figure 7. System monitoring includes collecting and analyzing monthly influent and effluent samples from the water and periodically collection of wellhead samples. The air stripping system would be capable of treating 300 gpm of water having the projected influent concentrations and would comply with the quality criteria for discharge to the Caribbean Sea. The costs of this alternative are as follows:

Capital Cost	$536,000
Annual O&M	$126,000
10-year Present Worth	$1,607,000
30-year Present Worth	$2,468,000

The time to implement (complete construction) this alternative is approximately one year, which does not include the time for design. At this time it is difficult to predict the ultimate concentration to which contaminants in the groundwater may be reduced with Alternative 3-I.

Because this alternative would result in contaminants remaining on Site above health based limits, CERCLA requires that this action be reviewed at least once every five years.

Alternative 3-II - Five Extraction Wells and Treatment with Discharge to the Caribbean Sea

Contaminated groundwater would be pumped from five recovery wells at a combined flow rate of approximately 1,400 gpm. This water would be piped to a treatment system. The utilization of five wells to contain the plume and extract contaminated groundwater is an active approach to the problem. The water would flow under pressure, through a sediment filter, then to an air stripping tower for aeration. The effluent from the tower would flow into a sump from which it would be pumped through piping to discharge at the channel leading to the Caribbean Sea in compliance with the water quality criteria for discharge to the Sea. The layout of this alternative leading to the Caribbean Sea is shown on

Figure 8. Preliminary design calculations included in the FS indicate that the tower would be 10 feet in diameter and have 3 feet of packing material. The overall height of the tower is estimated at 9 feet.

An alternative that would have placed treated water in the PRASA water distribution system was not evaluated because PRASA stated that it has enough water at the present time.

Four of the proposed recovery wells are PRASA Well Nos. 2, 3, 4 and 5. PRASA Well Nos. 2 and 5 each pumping at 300 gpm would provide lateral control to prevent further migration of PCE in the easterly or westerly direction. PRASA Well Nos. 3 and 4 each pumping at 300 gpm and located closest to the center of groundwater contamination would remove the highest concentrations of PCE from the aquifer. The new recovery well, to be located between the Core and SK&B facilities, is positioned to capture the leading edge of the PCE plume as well as the undefined haloether plume from Anaquest, and as a factor of safety to prevent PCE from migrating toward SK&B. Operation of the five recovery wells would not have an adverse impact on the aquifer. Based on the RI, the capture zones for these wells are small, which indicates that groundwater is not lowered over large areas of the aquifer through pumping.

Pumping the existing recovery wells at the proposed rates is identical to the situation which existed before the wells were shut down by PRASA. For this alternative, it will be necessary to install chloride monitoring wells near the coastline to monitor potential saltwater encroachment.

The costs of this alternative are as follows:

Capital Cost	$1,009,000
Annual O & M	$ 254,000
10-year Present Worth	$2,972,000
30-year Present Worth	$4,916,000

The time to implement this alternative (complete construction) is approximately two years, not including the time for design. At this time it is difficult to predict the ultimate concentration to which contaminants in the groundwater may be reduced with Alternative 3-II.

Because this alternative would result in contaminants remaining on Site above health based limits, CERCLA requires that this action be reviewed at least once every five years.

Alternative 3-III - Five Extraction Wells and Treatment with Discharge to the Irrigation Canal

This alternative has been developed by EPA and Commonwealth agencies based, in part, on a Commonwealth statute (P.R Department of Natural Resources Law 136) that requires the beneficial use of water resources in Puerto Rico. The Commonwealth maincains, that discharge of treated water to the ocean is not a beneficial use. This Alternative is a modification of Alternative 3-II. As in Alternative 3-II, contaminated groundwater would be pumped from five recovery wells at a combined flow rate of 1,400 gpm. The water would flow from the wells to an air stripping tower, and then it would be discharged to the Puerto Rico Electric Power Authority irrigation canal which provides water for agricultural and potable use. The treated groundwater will be discharged to the PREPA irrigation canal where it will also serve to recharge the aquifer unless it is determined during the Remedial Design (RD) that a more appropriate option exist for all or portions of the treated groundwater. In any event, the discharge must provide a beneficial use of the water. Because the water is to be discharged to an irrigation canal which may be used in part as a drinking water source without treatment and will infiltrate the ground thereby recharging the aquifer, the discharge water will have to meet MCLs. Because the irrigation canal also recharges the aquifer to some extent, placing the treated water in the canal will provide an added beneficial use of the treated water. For this alternative, it will be necessary to install chloride monitoring wells near the coastline to monitor potential saltwater encroachment. The costs of this Alternative are as follows:

Capital Cost	$1,291,684
Annual O & M	$ 270,868
10-year Present Worth	$3,383,256
30-year Present Worth	$5,455,591

The time to implement (complete construction) this alternative is approximately two years, not including time for design. At this time, it is difficult to predict the ultimate concentration to which contaminants in the groundwater may be reduced with Alternative 3-III.

Because this alternative would result in contaminants remaining on Site above health based limits, CERCLA requires that this action be reviewed at least once every five years.

This alternative has been included by the U.S. Environmental Protection Agency based on input from the Puerto Rico Department of Natural Resources, the United States Geological Survey, PRASA, EQB and the Commonwealth law that requires the beneficial and appropriate use of the natural resources of Puerto Rico.

Alternative 4 - Groundwater Extraction and Treatment with Reinjection

The extraction of groundwater in Alternative 4, as shown in Figure 9 is for the same wells and volume as described for Alternatives 3-II and 3-III. Because the water is to be reinjected into the ground, several modifications have to be made to the treatment system described in Alternative 3. First, the injection quality criteria would be MCLs which is more stringent than the discharge quality criteria for the ocean. Second, the effluent from the air stripping tower would flow into a 50,000 gallon clear well to give any particulates formed by aeration of the water an opportunity to settle. Lastly, the water would be pumped from the clear well through three 20,000 pound activated carbon columns prior to reinjection to guard against accidental releases or breakthrough of VOCs from the air stripping system to the aquifer. Nine reinjection wells would be located north of the Site to reinject the treated water to the aquifer with injecting capacity of 200 gpm each. Seven wells would be operating at any time with the two other wells serving as back up wells. Reinjection would resupply the aquifer with treated water. The process layout of Alternative 4 is shown on Figure 10. For this alternative, it will be necessary to install chloride monitoring wells near the coastline to monitor potential saltwater encroachment. The costs of this alternative are as follows:

Capital Cost	$2,457,000
Annual O&M	$ 441,000
10-year Present Worth	$5,861,000
30-year Present Worth	$9,233,000

The time to implement (complete construction) this alternative is approximately three years, not including time for design. At this time it is difficult to predict the ultimate concentration to which contaminants in the groundwater may be reduced with Alternative 4.

Because this alternative would result in contaminants remaining on Site above health based limits, CERCLA requires that this action be reviewed at least once every five years.

Alternatives for the Soil Disposal Area (SDA)

Alternative 1 - No Action

The No Action alternative requires no changes to the presently existing conditions at the SDA. Periodic air sampling would be conducted to monitor for airborne asbestos and the SDA would be visually inspected monthly by a certified inspector. The costs for the No Action alternative are as follows:

Capital Cost	$ 0
Annual O&M	$ 11,000
30-year Present Worth	$169,000

Because this alternative would result in hazardous substances remaining on Site, CERCLA requires that the site be reviewed at least once every five years.

Alternative 2 - Deed Restrictions, Physical Restrictions and Monitoring

This alternative involves obtaining a deed restriction, in compliance with Puerto Rico Law, to state that the land has been used for disposal of asbestos-containing waste material. It also involves securing the site by installing a 6 foot high industrial grade chain link fence and posting warning signs on it, at 100 meter (378 feet) intervals which are 20 by 14 inches in size. The signs would read: "Asbestos Waste Disposal Site. Do not Create Dust. Breathing Asbestos is Hazardous to your Health". Air monitoring for asbestos would be conducted semiannually upwind and downwind of the SDA. The SDA would be inspected visually every month by a certified inspector who would look for soil disturbance and exposed asbestos. The costs of this alternative are as follows:

Capital Cost	$ 63,000
Annual O&M	$ 11,000
30-year Present Worth	$232,000

The time to provide site security fencing and obtain deed restrictions under this alternative is approximately three months, not including the time for design.

Because this alternative would result in hazardous substances remaining on Site, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 3 - Capping, Deed Restrictions, Physical Restriction and Maintenance

Under this alternative, fill would be placed and compacted to level the irregular surface of the SDA. Six inches of top soil would be placed over the fill, graded so that the top surface is level and the sides do not exceed a slope of 1:2, and then compacted. The SDA would then be seeded with an appropriate mixture of native grasses. Signs identifying the SDA as an asbestos disposal area would be posted at 100 meter intervals. The cap would be inspected annually by a professional engineer to monitor the integrity of the cap and identify needed repairs. The costs of this alternative are as follows:

Capital Cost	$354,000
Annual O&M	$ 6,000
30-year Present Worth	$450,000

The time for capping the SDA and implementing the additional task

under this alternative is approximately six months, not including the time for design.

Because this alternative would result in hazardous substances remaining on Site, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 4 - Excavation of SDA and Disposal at an Authorized Landfill

This alternative consists of excavating the SDA and transporting the soil to a landfill authorized to accept asbestos. It is currently believed that the material can be disposed of at the Browning-Ferris Industries landfill in Ponce, Puerto Rico. Waste characterization sampling and analysis would be conducted on the soils by the receiving landfill prior to acceptance of the soil. The amount of soil to be excavated is approximately 9,010 cubic yards. Dust control and worker health and safety measures would be taken throughout the excavation process which is expected to require about three months. The excavated area would be restored by covering it with 6 inches of fill and 6 inches of top soil, then it will be mulched, seeded and fertilized. The costs of this alternative are as follows:

Capital Cost	$1,231,000
Annual O & M	$ 0
30-year Present Worth	$1,231,000

The time for excavating the SDA and transportation of the soil to an approved landfill is approximately 12 months, not including the time for design.

VIII. Summary of Comparative Analysis of Alternatives

EPA has developed nine criteria (OSWER Directive 9355.3-01), codified in the NCP §300.430(e) and (f), to evaluate potential alternatives to ensure all important considerations are factored into remedy selection. This analysis is comprised of an individual assessment of the alternatives against each criterion and a comparative analysis designed to determine the relative performance of the alternatives and identify major trade-offs, that is, relative advantages and disadvantages, among them.

The nine evaluation criteria against which the alternatives are evaluated are as follows:

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are

eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Applicable, or Relevant and Appropriate Requirements (ARARs)** addresses whether or not a remedial alternative would meet all of the applicable or relevant and appropriate (ARARs) requirements of other federal and state environmental statutes and/or satisfy the criteria for invoking a waiver as set forth in Section 121 (a) of CERCLA.

Primary Balancing Criteria - The next five "primary balancing criteria" are to be used to weigh trade-offs among the different hazardous waste management strategies.

3. **Long-term Effectiveness and Permanence** focuses on any residual risk remaining at the Site after the completion of the remedial action. This analysis includes consideration of the degree of threat posed by the hazardous substances remaining at the Site and the adequacy of any controls (for example, engineering and institutional) used to manage the hazardous substances remaining at the Site. It also considers how effective and permanent the remedy is in the long term.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** is the anticipated performance of the treatment technologies a particular remedy may employ.

5. **Short-term Effectiveness** addresses the effects of the alternative during the construction and implementation phase until the remedial response objectives are met. It also considers the time required to implement the remedy.

6. **Implementability** addresses the technical and administrative feasibility of implementing an alternative including the availability of various services and materials required during its implementation.

7. **Cost** includes estimated capital, and operation and maintenance costs, both translated to a present-worth basis. The detailed analysis evaluates and compares the cost of the respective alternatives, but draws no conclusions as to the cost-effectiveness of the alternatives. Cost-effectiveness is determined in the remedy selection phase, when cost is considered along with the other balancing criteria.

Modifying Criteria - The final two criteria are regarded as "modifying criteria", and are to be taken into account after the

above criteria have been evaluated. They are generally to be focused upon after public comment is received.

8. **State Acceptance** reflects the statutory requirement to provide for substantial and meaningful State involvement.

9. **Community Acceptance** refers to the community's comments on the remedial alternatives under consideration, along with the PP. Comments received during the public comment period, and the EPA's responses to those comments, are summarized in the Responsiveness Summary which is a part of this ROD.

The following is a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria.

1. Overall Protection of Human Health and the Environment

Groundwater: Contaminant concentrations in groundwater underlying and downgradient of the Site exceed MCLs for tetrachloroethylene (PCE), trichloroethylene, vinyl chloride, carbon tetrachloride, Enflurane and Isoflurane. Alternatives 1 and 2 are not protective of human health and the environment because they do not eliminate, reduce or control the contaminants at the Site. Since they do not meet this threshold criterion, these alternatives will not be discussed further. Alternatives 3-I, 3-II, 3-III and 4 for the groundwater media would provide overall protection by permanently reducing the toxicity, mobility and volume of contaminants, through treatment of the contaminated water to meet Federal and Commonwealth water quality criteria. Alternatives 3-II, 3-III, and 4 provide for greater protection of the environment than Alternative 3-I because the extraction wells proposed under Alternatives 3-II, 3-III, and 4 are capable of removing greater portions of contaminants from the aquifer, thereby expediting aquifer restoration than under Alternative 3-I. These alternatives will provide the greatest overall protection of human health and the environment.

Soil Disposal Area: The no action alternative requires no change to the existing conditions at the Site and as such would not provide overall protection of human health and the environment. Therefore, it was eliminated from further consideration and will not be discussed further. Alternatives 2, 3 and 4 would provide overall protection of public health and the environment. Under Alternative 2, deed restriction, physical restrictions and monitoring would be implemented while leaving the soil at the SDA. Alternative 3 would afford greater protection than Alternative 2 since it includes the steps done under Alternative 2 plus capping of the SDA. Alternative 4 would provide the best

overall protection because it would eliminate the presence of asbestos at the Site through excavation and off Site disposal, and no residual contaminated soil will remain at the Site.

2. Compliance with ARARs

Groundwater: The groundwater underlying the Site is a past and potential future potable water supply source. Therefore, MCLs and non-zero Maximum Contaminant Level Goals (MCLGs) are ARARs. The Puerto Rico MCLs are relevant and appropriate for the cleanup of the aquifer. Tables 14 and 15 present the Federal and Commonwealth chemical-specific groundwater ARARs for the Site. Alternatives 3-I, 3-II, 3-III and 4 will comply with these ARARs. The treatment systems are equally capable of treating extracted groundwater to MCLs. The air-stripping system proposed under Alternatives 3 and 4 is equally capable of meeting federal and state requirements for air emissions. Air emissions of the air-stripping system will comply with Puerto Rico Rule 419, Regulation for the Control of Atmospheric Pollution, which is an ARAR.

Direct discharge of treated water to the Caribbean Sea and the PREPA irrigation canal under Alternatives 3-I, 3-II, and 3-III will comply with Rule 4282 of the Puerto Rico Water Quality Standard. Law No. 9 is relevant and appropriate to these discharges. The Federal NPDES regulation promulgated pursuant to the Clean Water Act Section 402(a) for discharges is however, applicable.

PRDNR Law 136 requires a beneficial use of the waters of Puerto Rico, thus avoiding waste. This is not an ARAR, but rather a To Be Considered (TBC) criterion. Alternatives 3-I and 3-II do not provide a beneficial use of the treated water. Alternative 3-III provides a beneficial use of the water and will also comply with Federal and Commonwealth drinking water standards.

Groundwater reinjection under Alternative 4 will comply with the Underground Injection Regulations pursuant to the Commonwealth Law No. 9 and the Federal Underground Injection Control Regulations, whichever is more stringent.

Soil Disposal Area: The alternatives that would comply with the federal ARARs for asbestos-containing material in the SDA are Alternative 2, 3, and 4. The SDA contains asbestos at concentrations between two per cent (2 %) and four per cent (4 %). The NESHAPS regulation, promulgated pursuant to the Clean Air Act, requires that materials containing asbestos in concentrations exceeding one percent (1 %) be regarded as "asbestos-containing material". Alternatives 2 and 3 would provide warning signs, Site security throughout with a fence to restrict access by the general public and a deed restriction to

advise property owners and users of possible risk associated with the SDA. Alternative 3 would additionally provide for capping the SDA. During the implementation of Alternative 4, stringent controls would have to be implemented during remedial activities to assure compliance with ARARs for airborne asbestos concentrations and reduce any threat to the community from transport of asbestos waste.

3. Long-Term Effectiveness

Groundwater: Alternatives 3-I, 3-II, 3-III and 4 would provide long-term effectiveness while attaining MCLs thereby resulting in minimal risk from contaminant residuals in groundwater.

In addition, Alternatives 3-II, 3-III and 4 more actively contain the plume and extract contaminated groundwater. They provide the most reliable long-term effectiveness, due to the location and pumping rates of the extraction wells.

However only, alternative 3-III and Alternative 4 provide for a beneficial use of the water by recharging the aquifer with treated groundwater.

Soil Disposal Area: Alternative 4 would be the most effective and permanent alternative since it would eliminate the risk of long-term exposure through the excavation and the transportation of the soils to an authorized landfill. The effectiveness of Alternatives 2 and 3, which leave the asbestos-containing material in place, are dependent upon the implementation of the deed restriction which may be difficult to enforce in the long term. The area in which the SDA is located is currently owned by PRIDCO and operated by Ayest-Wyeth. Alternative 2 would be the least effective remedy, as it requires a monthly inspection and extensive monitoring to assure that the asbestos remains undisturbed. Alternative 3 will also require continual maintenance (although less than Alternative 2) to assure its long term effectiveness.

4. Reduction of Toxicity, Mobility or Volume Through Treatment

Groundwater: Alternatives 3-I, 3-II, 3-III and 4 would reduce the toxicity, mobility and volume of contaminants permanently through extraction and treatment of contaminated groundwater. Alternatives 3-II, 3-III, and 4 would provide maximum reduction of toxicity, mobility or volume through treatment due to the higher extraction rates and location of the extraction wells. Reducing the level of toxicity in the aquifer will reduce the cancer risk posed to future unauthorized users of the aquifers, should institutional controls fail.

Soil Disposal Area: Alternative 2 would prevent the Site from being disturbed, which may prevent dispersion of asbestos. The mobility of any asbestos in the SDA would be further reduced in Alternative 3 through installation of a soil cap and vegetative cover. The toxicity and volume of any asbestos in the SDA would not be reduced by Alternatives 2 or 3. Alternative 4 would eliminate the presence of asbestos at the site thus restricting the mobility of the asbestos at the Site more effectively than the other alternatives. None of the alternatives comply with the statutory preference for treatment.

5. Short-Term Effectiveness

Groundwater: Alternatives 3-I, 3-II, 3-III and 4 are not expected to cause any short-term adverse impacts to human health during the construction of the treatment systems. Although it is difficult to predict the amount of time it will take to achieve MCLs, Alternatives 3-II, 3-III and 4 have higher extraction rates, thereby expediting aquifer clean up.

Soil Disposal Area: Alternative 2 is protective in the short term by securing the site with a fence and by installing warning signs. This could be implemented in approximately 3 months. With capping, under Alternative 3, some risks due to remediation may occur during cap construction but are lower than the short term risks posed by Alternative 4. Remedial response objectives could be achieved approximately one year from completion of the design. Alternative 4 would require the implementation of preventative measures to provide short-term effectiveness during the excavation and disposal of the soil. Dust control and worker health and safety measures would be taken throughout the excavation process which is expected to take about three months.

6. Implementability

Groundwater: Deed restrictions for Alternatives 3-I, 3-II, 3-III and 4 would be obtained with the cooperation of PRIDCO and the Land Authority although they may be difficult to enforce. Alternatives 3-I, 3-II, 3-III and 4 are technically feasible as the necessary equipment, services and materials are readily available for constructing the system. Packed tower aeration and GAC are commercially available, demonstrated and common technologies. These alternatives will require obtaining an agreement with PRASA for the use of the PRASA wells. Alternative 3-111 requiresan agreement with PRIDCO for use of the land for the treatment systems and with PREPA for the use of the irrigation channel to discharge the treated water. In addition, permits may be required by PRDNR for the chloride monitoring wells under Alternative 3-II, 3-III, and 4 if they are located off-site. Alternative 4 would be the most difficult to implement in comparison to Alternatives 3-I, 3-II and 3-III, because it

requires more operation and maintenance activities than the other Alternatives.

Soil Disposal Area: Implementation of Alternative 2 is dependent upon the ease with which the deed restriction can be obtained. Administrative difficulties may be encountered because negotiations would be required with several administrative authorities. The property owner would have to implement the deed restriction. In addition, this area had not been permitted for solid waste disposal which may create administrative difficulties in obtaining the deed restriction. Alternative 3 has similar problems in implementability. In addition to the problem of Alternative 2, it may require a permit for closure of a waste disposal area from EQB. Alternative 4 is technically feasible. Soil excavated would be transported and disposed of in an appropriate landfill and no residue would remain at the Site.

7. Cost

Groundwater: Alternative 3-I is the least costly with a capital cost of $536,000, annual O&M of $126,000, 10-year present worth of $1,607,000 and a 30-year present worth of $2,468,000. Alternative 3-II has a capital cost of $1,009,000, annual O&M of $254,000, 10-year present worth of $2,972,000 and a 30-year present worth of $4,916,000. Alternative 3-III is similar to Alternative 3-II in cost. Its capital cost is $1,291,684, annual O&M of $270,868, 10-year present worth of $3,383,256 and the 30-year present worth of $5,445,591. Alternative 4 is the most costly with a capital cost of $2,457,000, annual O&M of $441,000 and a 10-year present worth of $5,861,000 and a 30-year present worth of $9,233,000.

Soil Disposal Area: Alternative 2 has a capital cost of $63,000; O&M is $11,000. Its 30- year present worth is $232,000. Alternative 3 is the next most costly with a capital cost of $354,000; O&M is $6,000. Its 30-year present worth is $450,000. Alternative 4 is the most costly with a capital and present worth cost of $1,231,000.

8. State Acceptance

Concurrence letters from EQB are attached to this Record of Decision at Appendix C.

9. Community Acceptance

The local community expressed opposition to Alternatives 1 and 2 and is in favor of an expedited restoration of the aquifer to the maximum extent practicable which will be attained with Alternative 3-III. The local community is in favor of the elimination of the asbestos containing material in the SDA. All comments are addressed in the responsiveness summary, which is

appended to this ROD.

IX. Description of the Selected Remedy

Based on the results of the RI/FS reports, as well as a detailed evaluation of all comments submitted by interested parties during the public comment period, and the rest of the administrative record for the Site, EPA has selected Alternative 3-III for the groundwater contamination and Alternative 4 for the SDA, as the selected alternative for addressing the contamination problem at the Fibers Public Supply Wells Site. Specifically, the selected alternative will involve the following:

Groundwater Contamination

- Contaminated groundwater will be pumped from five recovery wells at a combined flow rate of approximately 1,400 gpm. However, the actual pumping rate will be determined during the Remedial Design.

- Sediment/particulate filtration and air stripping will be installed to remove VOCs.

- Treated groundwater will be discharged to the PREPA irrigation canal where it will serve to recharge the aquifer unless it is determined during the RD stage that a more appropriate option exists for all or portion of the treated groundwater. In any event, the discharge must provide a beneficial use of the water.

- A long-term monitoring program will be implemented to track the migration and concentrations of the contaminants of concern and assess performance of the groundwater remediation.

- Chloride monitoring wells will be installed near the coastline to monitor potential saltwater encroachment.

- A system monitoring program will be implemented which includes the collection and monthly analysis of influent and effluent from the air stripping tower and periodic collection of wellhead samples.

- The Site conditions will be evaluated at least once every five years to determine if a modification to the selected alternative is necessary.

- EPA may invoke a technical waiver of the ARARs if the remediation program indicates that reaching MCLs in the aquifer is technically impracticable.

Soil Disposal Area

- The soil disposal area will be excavated and the contaminated soils will be transported to an authorized landfill for disposal.It is estimated that approximately 9,010 cubic yards of soils will be excavated and disposed of.

- Dust control and worker health and safety measures as well as measures to protect the local community during trasnportation of asbestos-containing material will be taken throughout the excavation process.

- The SDA will be regraded once excavation activities are completed.

The ultimate goal of the EPA Superfund Program's approach to groundwater remediation as stated in the NCP is to return usable groundwater to their beneficial use within a reasonable time frame. Therefore, for the Fibers aquifer which is classified as a Class II aquifer, the final remediation goal will be the MCLs. EPA may invoke a technical waiver of the groundwater ARARs if the remediation program indicates that reaching MCLs in the aquifer is technically impracticable.

Alternatives 3-III and 4, with their network of five extraction wells, are capable of removing the most contaminants, providing for the most control of contaminant migration, and restoring the aquifer the fastest. Given the uncertainties that saltwater intrusion could be a problem and the costliness of Alternative 4, which is approximately twice the cost of Alternative 3-III, it is uncertain whether the actual need for reinjection would be necessary to avoid saltwater intrusion and as such, did not justify the added cost of Alternative 4. Therefore, EPA cannot determine that Alternative 4 would be a cost-effective alternative. If at any time it is determined that saltwater intrusion is occurring to an extent which is detrimental to the freshwater aquifer, the selected alternative will be reevaluated and may be modified.

On the other hand, Alternative 3-III, with a network of five extraction wells and treatment with discharge to the irrigation canal, is capable of reducing contaminant concentration levels in the most heavily contaminated portion of the aquifer. Also it will provide for control of contaminant migration, restore the aquifer faster than Alternatives 3-I or 3-II, and provide a beneficial use of the treated water, avoiding its waste while resupplying the aquifer.

During the design process, the pumping rates and exact locations will be determined in order to reach an optimal groundwater extraction scenario.

X. Statutory Determinations

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. CERCLA also requires that the selected remedial action for the Site comply with applicable or relevant and appropriate environmental standards established under federal and State environmental laws, unless a waiver is granted. The selected remedy must also be cost-effective and utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also contains a preference for remedies that include treatment as a principal element. The following sections discuss how the selected remedy for contaminated groundwater and the SDA at the Site meets these statutory requirements.

1. Protection of Human Health and the Environment

In order to meet the remedial objectives outlined in the previous section, the risk associated with exposure to the contaminated groundwater must fall within the acceptable risk range for carcinogens. Attainment of MCLs and proposed MCLs is also necessary to ensure that the remedy is protective. The selected remedy protects human health and the environment by reducing levels of contaminants in the groundwater through extraction and treatment as well as through a deed restriction. Alternative 3-III will provide overall protection by reducing the toxicity, mobility and volume of contamination, permanently, through treatment of the contaminated water to meet federal and state water quality criteria.

The selected remedy for the SDA will provide the best overall protection because it would eliminate the presence of asbestos at the Site through excavation and off-site disposal, and no residual contaminated soil will remain at the Site. It also will reduce the risk of long term exposure because the mobility, toxicity and volume of asbestos at the Site will be eliminated.

2. Compliance with Applicable or Relevant and Appropriate Requirements of Environmental Laws

All ARARs would be met by the selected remedy.

Chemical Specific ARARs - The selected remedy would achieve compliance with chemical specific ARARs related to the groundwater at the Site. The relevant and appropriate requirements include the MCLs promulgated pursuant to the Safe Drinking Water Act. Some contaminants of concern identified for the Site have MCLs. Values for MCLs, proposed MCLs and PRMCLs are listed in Tables 21 and 22.

At the present time it is expected that air emissions from the air-stripping tower will not be a problem. Air emissions will be monitored and if necessary controls will be implemented.

With the implementation of the selected remedy for the SDA, Federal Clean Air Act NESHAPS requirements for asbestos-containing materials will be met.

3. Cost-Effectiveness

EPA believes the selected remedy is cost-effective in mitigating the principal risk posed by contaminated groundwater within a reasonable period of time. Section 300.430(f)(ii)(D) of the NCP requires EPA to evaluate cost-effectiveness by comparing all the alternatives which meet the threshold criterion of protection of human health and the environment, against three additional balancing criteria of long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness. The selected remedy meets these criteria and provides for overall effectiveness in proportion to its cost. The estimated cost for the selected remedy has a capital cost of $2,522,684, annual O&M of $270,868, and 30-year present worth of $6,686,591.

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

The selected remedy for the groundwater satisfies this criterion by the use of an air stripping system to treat contaminated groundwater. The selected remedy for the SDA will be the most effective and permanent alternative since it would eliminate the risk of long-term exposure through the excavation and the transportation of the soils to an authorized landfill. This alternative does not meet the statutory requirements to utilize permanent solutions and treatment technologies to the maximum extent practicable because there is no method to treat asbestos.

5. Preference for Treatment as a Principal Element

The selected remedy satisfies the statutory preference for remedies employing treatment that permanently and significantly reduce the toxicity, mobility or volume of hazardous substances. The selected remedy includes the installation and operation of groundwater extraction wells for contaminant recovery. Since treatment of the ecavated soil was not found to be practicable, the remdy for this area does not satisfy the statutory preference for treatment as a principal element of the remedy for the SDA. Therefore, the only protective remedy for the SDA is to properly dispose of the materials in an appropriate, permitted landfill.

XI. Documentation of Significant Changes

The Proposed Plan for the Fibers Public Supply Wells Site was released for public comment in July 20, 1991. The Proposed Plan identified Alternative 3-III with five extraction wells and treatment with discharge to the irrigation canal, as the preferred alternative for the groundwater contamination.

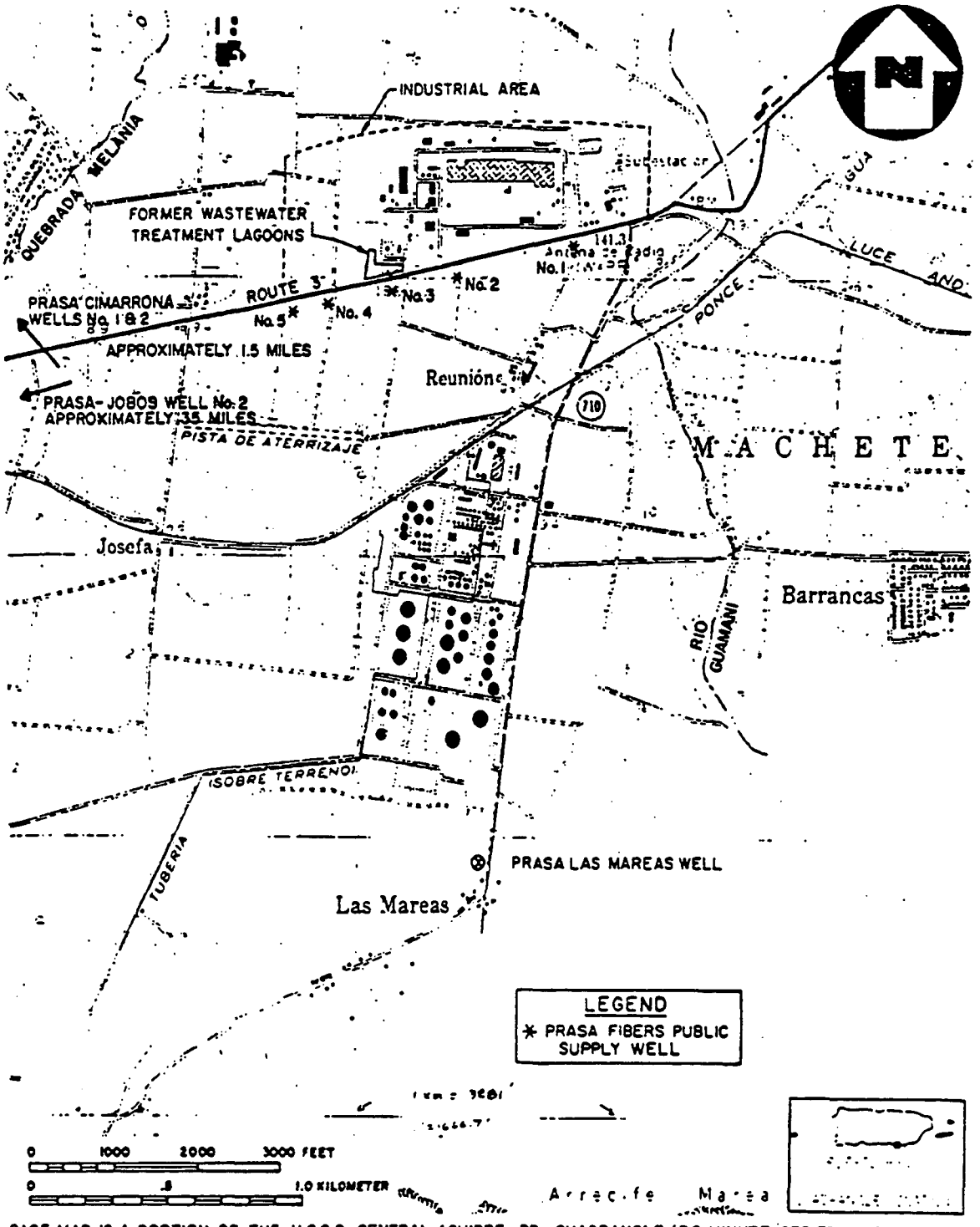
Upon review of the comments received during the comment period, EPA decided to provide some flexibility with regard to how the treated water should be handled. Unless the RD shows a more appropriate option, all or a portion of the treated water will be transported to the existing PREPA irrigation channel to the north of the Site as was described in Alternative 3-III.

FIGURES

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

APPENDIX A

FIGURE NO. 1



BASE MAP IS A PORTION OF THE U.S.G.S. CENTRAL AGUIRRE, PR. QUADRANGLE (7.5 MINUTE SERIES, 1970, PHOTO-REVISED 1982, CONTOUR INTERVAL 10 METERS)

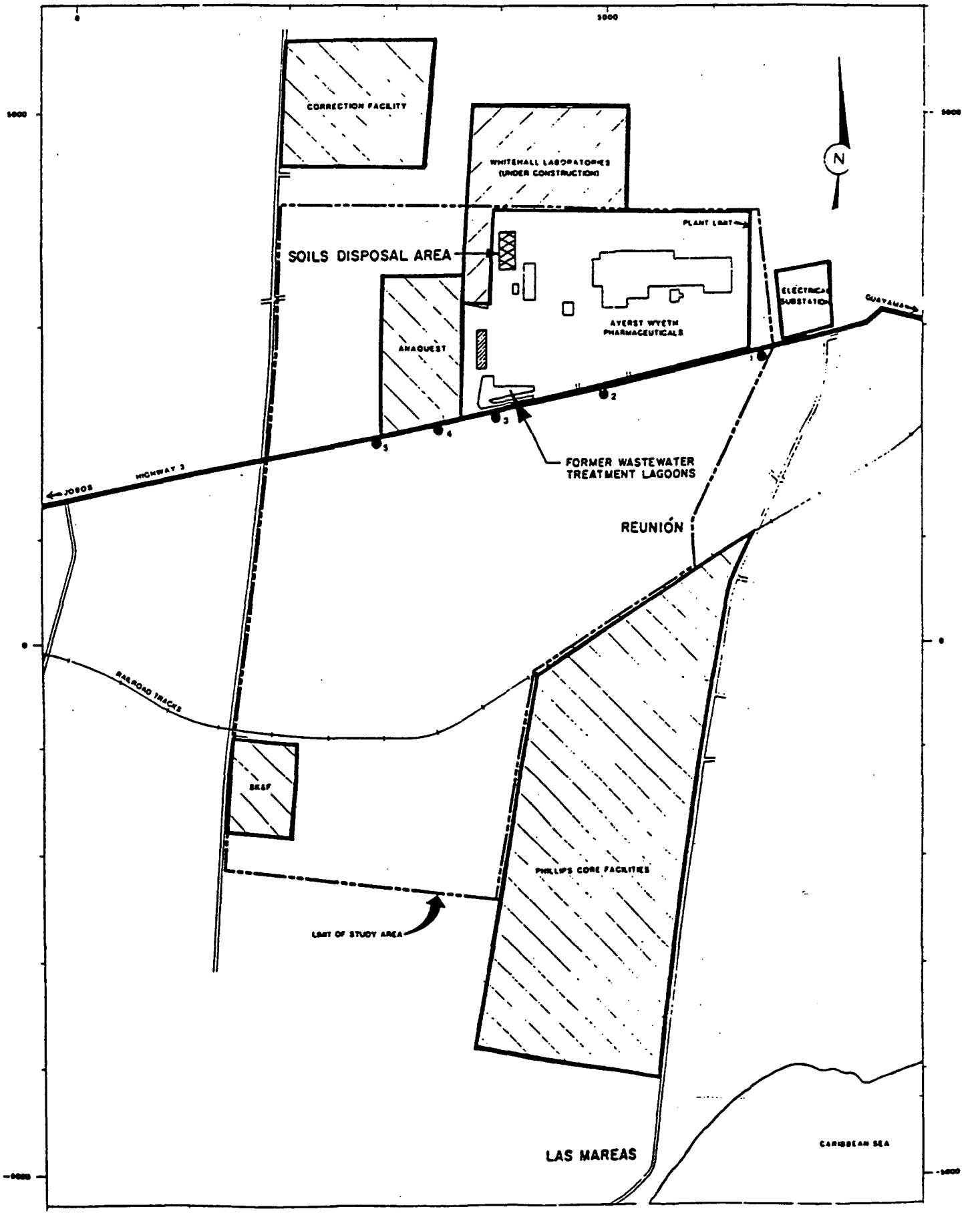
LOCATION MAP
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO
SCALE 1:20,000

FIGURE 1

NUS CORPORATION

POOR QUALITY ORIGINAL

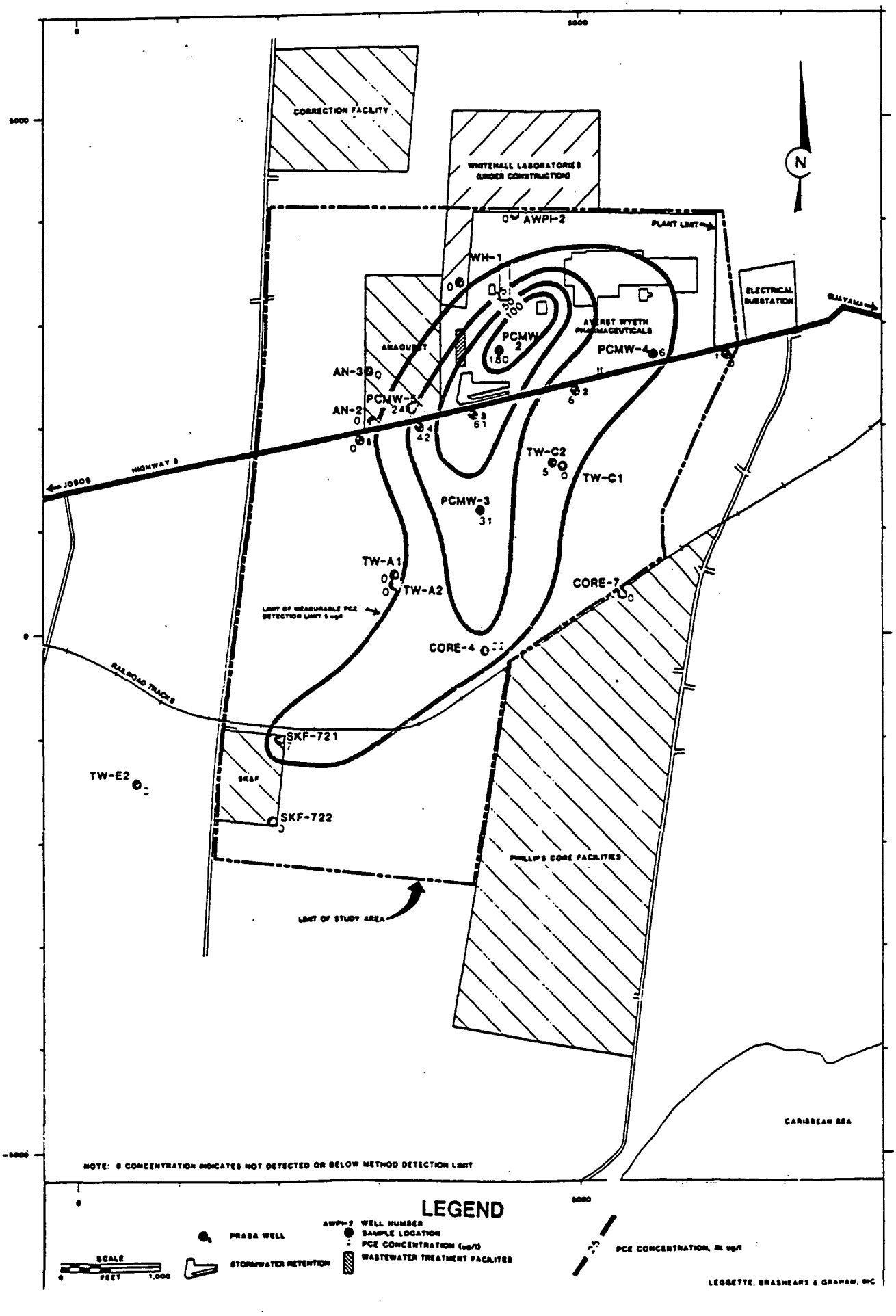
FIGURE NO. 2 STUDY AREA AND AREA FACILITIES
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO



FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

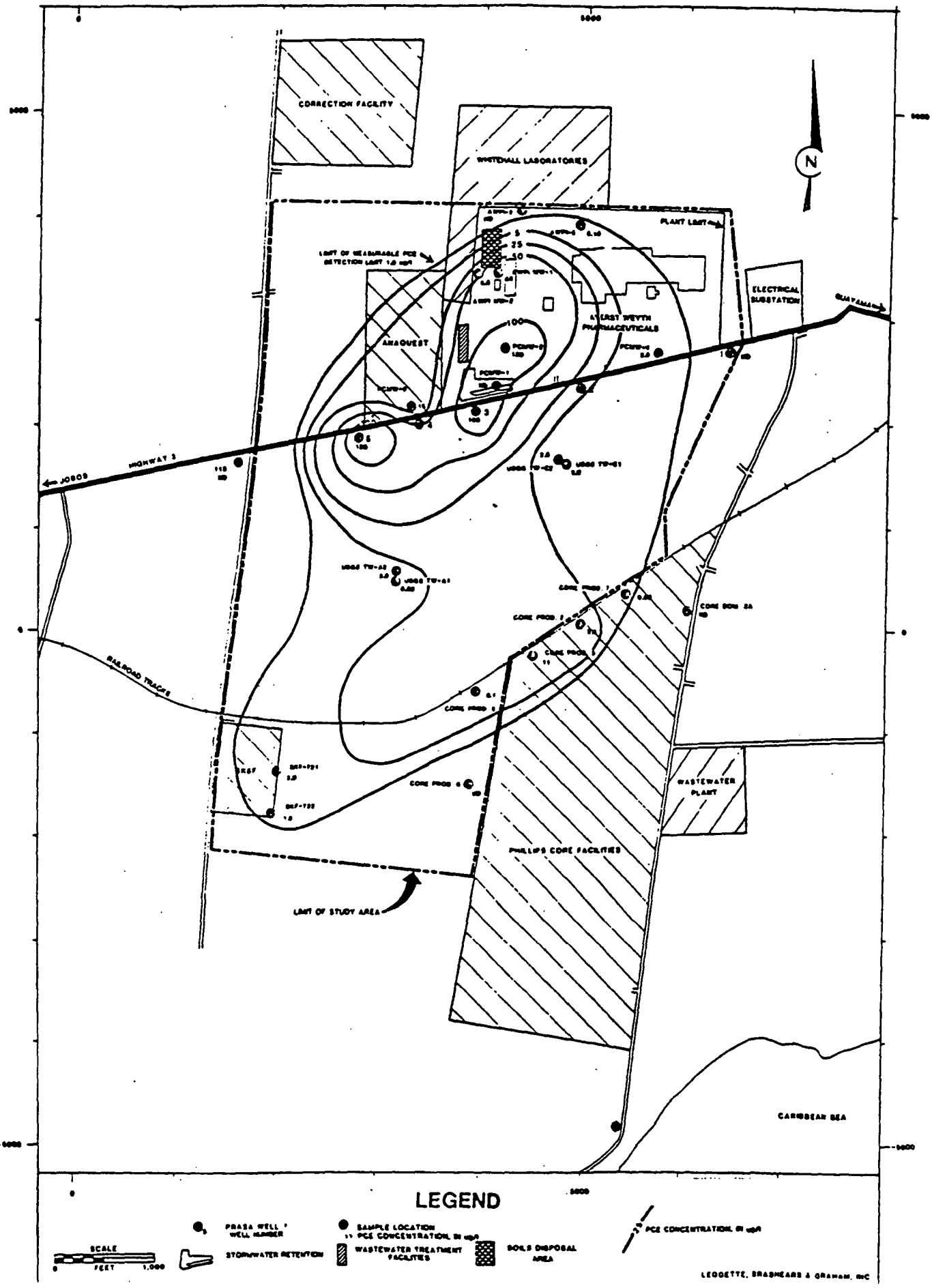
Figure No. 3 EXTENT OF DISSOLVED PCE IN THE GROUND WATER—1988

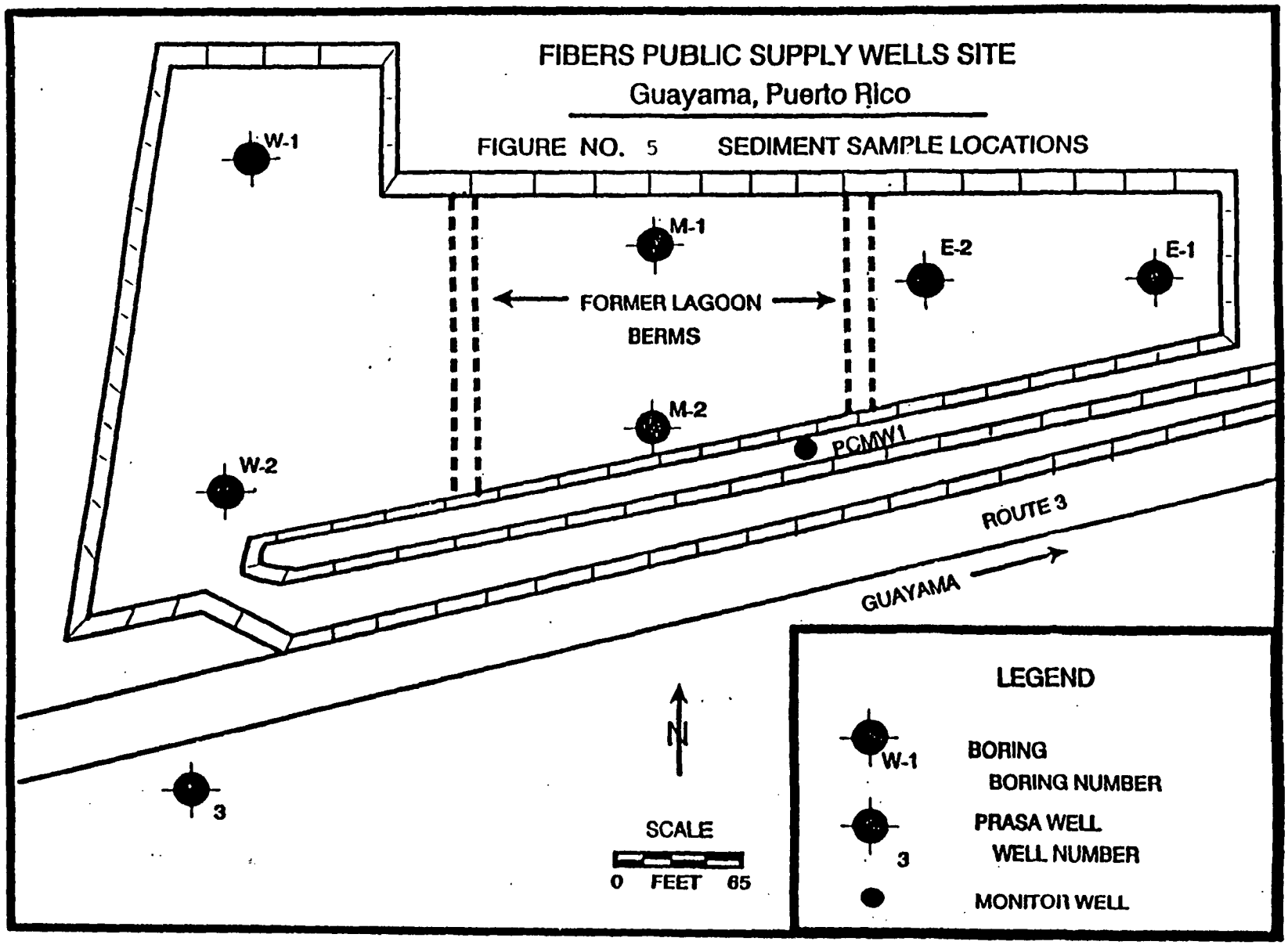


FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

Figure No. 4 EXTENT OF DISSOLVED PCE IN THE GROUND-WATER-1990

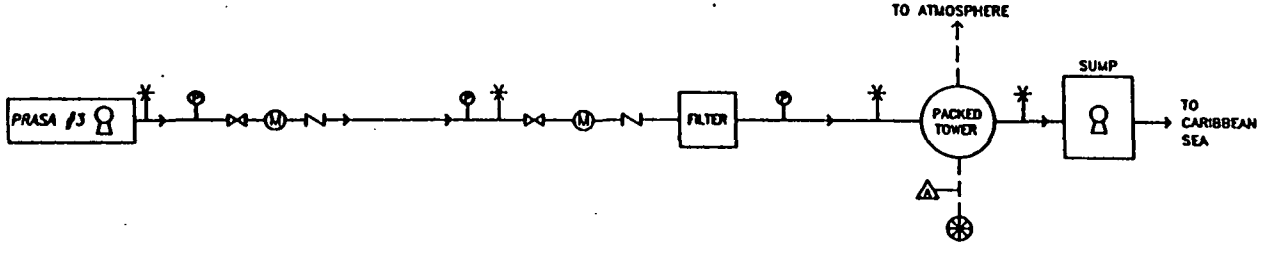



FIBERS PUBLIC SUPPLY WELLS SITE
Guayama, Puerto Rico
FIGURE NO. 5 SEDIMENT SAMPLE LOCATIONS
W-1
M-1
E-2
E-1
FORMER LAGOON
BERMS
M-2
PCMW1
W-2
ROUTE 3
GUAYAMA
3
N
SCALE
0 FEET 65
LEGEND
W-1
BORING
BORING NUMBER
PRASA WELL
3
WELL NUMBER
MONITOR WELL

FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

Figure No. 6 CONCEPTUAL PROCESS DIAGRAM OF ALTERNATIVE 3-I



LEGEND

PRASA #3 RECOVERY WELL

WATER FLOW

AIR FLOW

PRESSURE GAUGE

SAMPLE VALVE

GATE VALVE

FLOW METER

CHECK VALVE

AIR-FLOW SENSOR

BLOWER

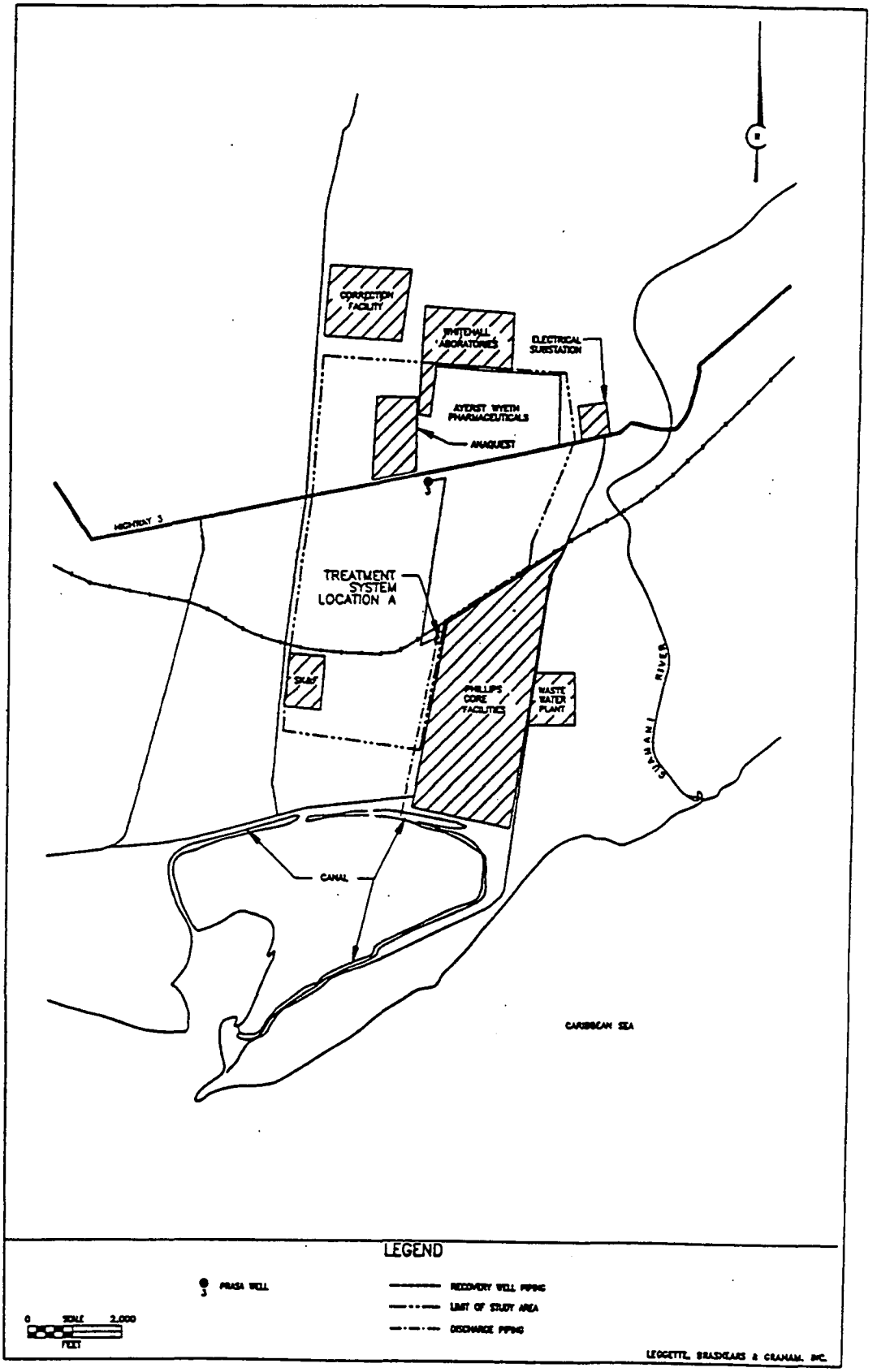
PUMP

LEGGETTE, BRASHEARS & GRAHAM, INC.

FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

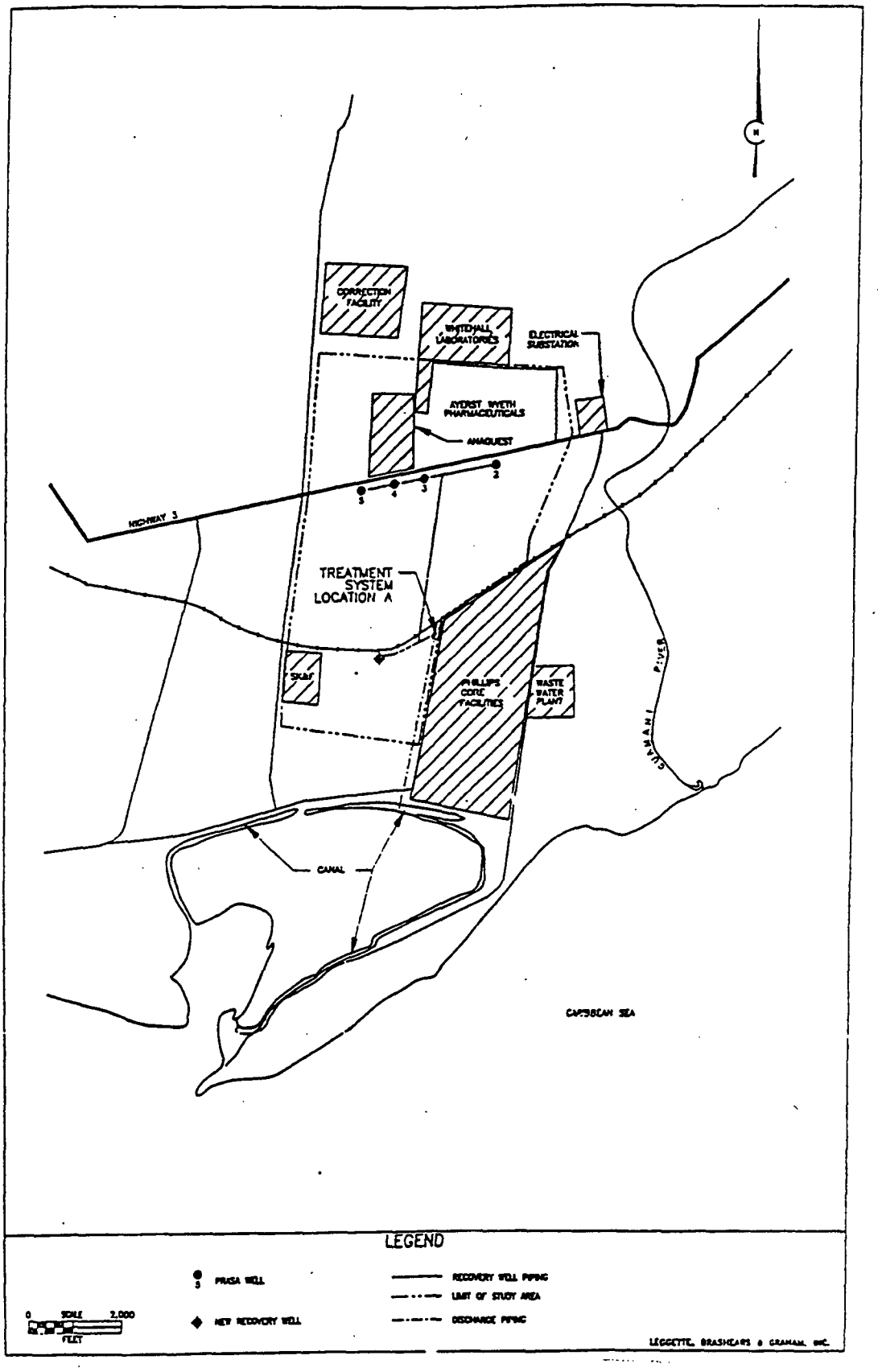
Figure No. 7 LAYOUT OF ALTERNATIVE 3-I



FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

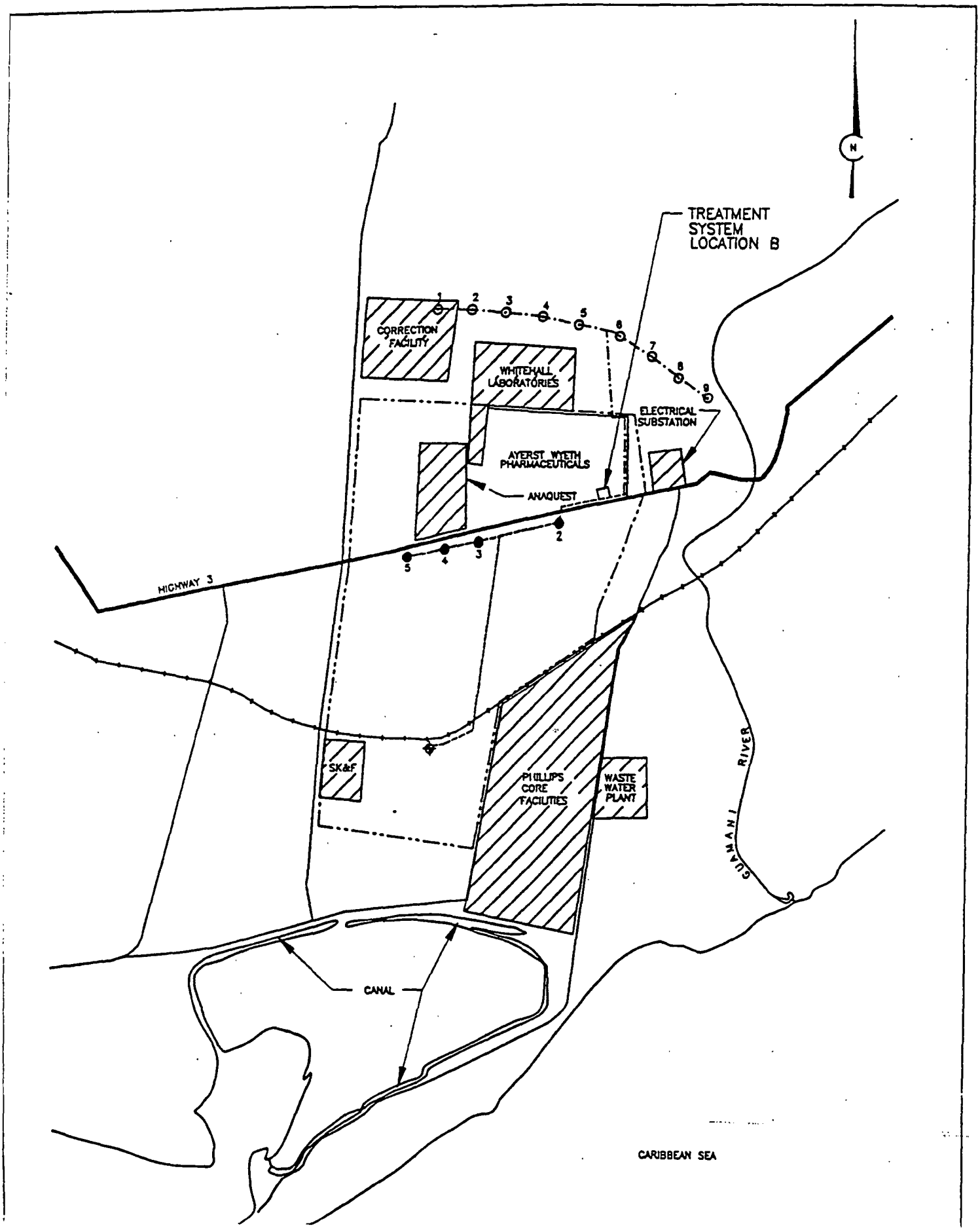
Figure No. 8 LAYOUT OF ALTERNATIVE 3-II



FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

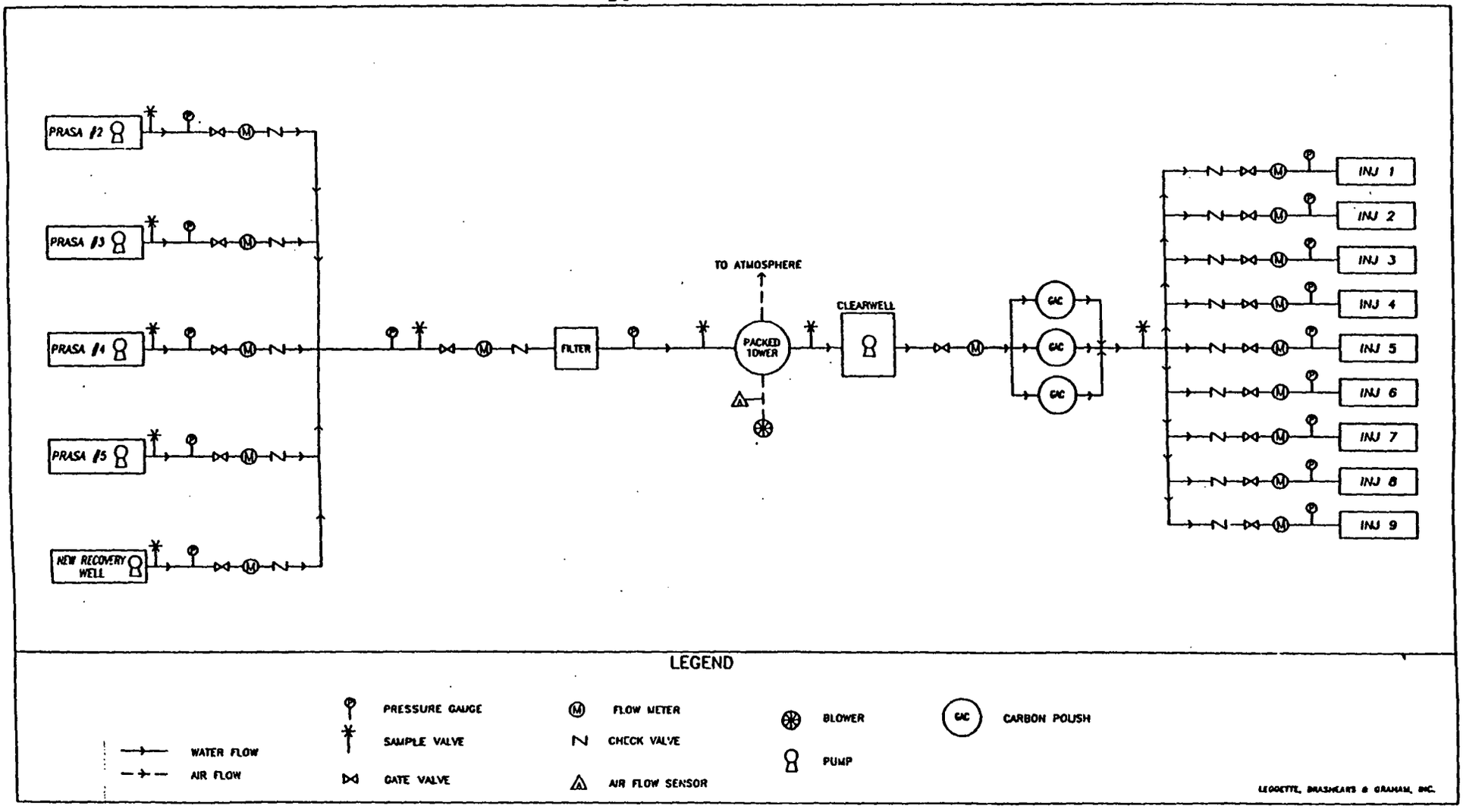
Figure No. 9 - LAYOUT OF ALTERNATIVE 4



FIBERS PUBLIC SUPPLY WELLS SITE

Gueyama, Puerto Rico

Figure No. 10 CONCEPTUAL PROCESS DIAGRAM OF ALTERNATIVE 4



TABLES

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

APPENDIX B

FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

SUMMARY OF GROUND-WATER QUALITY, ROUNDS 1 AND 2

Table 1 (Continued)

PARAMETER	UNITS	PW-A1	PW-A2	PW-C1	PW-C2	PW-E2	CORE-4	CORE-7	SW-721	SW-722	AM-2	AM-3	MW-1	MW-10
		ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2	ROUND 2
Sample Date		11/24/87	11/20/87	11/20/87	11/20/87	11/23/87	11/18/87	11/19/87	2/10/88	2/10/88	2/9/88	2/9/88	2/9/88	2/9/88
PRIORITY POLLUTANT VOLATILES GC/MS														
Chlorodibromomethane	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l	BDL	BDL	ND	ND	ND	BDL	ND	BDL	BDL	BDL	ND	ND	ND
Dichlorobromomethane	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ug/l	ND	BDL	110	BDL	ND	ND	ND	BDL	ND	BDL	BDL	12	BDL
Tetrachloroethylene	ug/l	BDL	BDL	ND	5	ND	22	BDL	7	BDL	BDL	ND	ND	ND
1,2-Trans-dichloroethylene	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/l	ND	ND	ND	ND	ND	ND	ND	10	BDL	ND	ND	20	9
Vinyl chloride	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT ACIDS GC/MS														
Phenol	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT METALS														
Arsenic	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	ug/l	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND
Lead	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	ND	ND	ND	22	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l	11	14	ND	24	ND	ND	ND	45	26	ND	8.2	4.6	ND
GROUND-WATER CONVENTIONALS														
Chloride	mg/l	25.7	30.8	27.2	23.4	34.9		27.2	19.7	44.6	34.2	22.3	19.6	19.7
Sulfate as SO4	mg/l	26	31	30	21	44	25	20	20.0	57.0	28.0	17.0	17.0	21.0
Specific Conductance	umho	434	446	526	403	830		421	323	955	424	382	325	323
MISCELLANEOUS PARAMETERS														
Acetone	ug/l	BDL	BDL	39	BDL	15	ND	ND	ND	ND	ND	ND	BDL	ND
Aluminum	mg/l	0.05	0.09	0.09	0.07	0.1	ND	ND	0.05	0.06	0.1	0.06	0.07	0.06
Ammonia as N	mg/l	0.3	< .2	< .2	< .2	0.3	< .05	< .05	< .5	< .4	< .2	< .2	< .2	< .4
Barium	ug/l	18	43	43	24	33	29	36	4.8	29	38	21	26	26
Bicarbonate as CaCO3	mg/l	170	190	230	160	400	180	160	250	400	160	95	120	120
Calcium	mg/l	40.8	44	61.8	37.1	77.2	41.2	37.1	45.2	73.6	40.3	35.3	26	26.4
Cobalt	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	mg/l	0.02	0.03	0.02	0.02	0.02	ND	ND	0.01	0.03	0.04	0.01	0.05	0.02
Magnesium	mg/l	16.6	18.9	19.2	13.7	40.8	16.7	15.7	17.9	36.9	15.9	12.5	11.7	11.9
Manganese	mg/l	0.017	0.014	0.006	0.015	0.422	.01	.005	0.007	0.05	0.005	0.002	0.002	0.001
2-Butanone	ug/l	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/l	1.3	0.4	0.6	1.1	1.0	0.4	1.2	0.7	0.6	0.4	0.3	0.6	0.6
Sodium	mg/l	29.8	30.5	27.8	28.1	46.8	37.6	28.6	74.4	93.2	36.6	32.2	28.5	27.3
Sulfide as S	mg/l	< .05	< .05	0.13	< .05	< .05	0.27	< .05	< .05	< .05	0.15	< .05	< .05	< .05
Total Dissolved Solids (TDS)	mg/l	220	280	340	240	480	300	260	380	580	340	260	240	270
Vanadium	ug/l	8.1	8.7	11	9.7	14	8.2	7.4	11	16	4.2	4.9	3.1	3.5

FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

SUMMARY OF GROUND-WATER QUALITY, ROUNDS 1 AND 2

Table 1

PARAMETER	UNITS	POW-1		POW-2		POW-2D		POW-3		POW-4		POW-5	
		ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2
Sample Date		8/27/87	11/18/87	8/27/87	11/18/87	8/27/87	11/18/87	8/27/87	11/19/87	8/26/87	11/18/87	8/27/87	11/18/87
PRIORITY POLLUTANT VOLATILES GC/MS													
Chlorodibromomethane	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	BDL
Dichlorobromomethane	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ug/l	BDL	ND	BDL	ND	ND	ND	BDL	ND	BDL	ND	ND	BDL
Tetrachloroethylene	ug/l	8.9	ND	108	180	110	230	21.2	51	BDL	6	30.6	24
1,2-trans-dichloroethylene	ug/l	12.2	5	14.2	14	ND	17	ND	ND	ND	ND	ND	BDL
Trichloroethylene	ug/l	17.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	ND	ND	ND	ND
Trichlorofluoromethane	ug/l	-	ND	-	7	-	9	-	ND	-	ND	-	ND
Vinyl chloride	ug/l	23.1	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT ACIDS GC/MS													
Phenol	ug/l	12	260*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT METALS													
Arsenic	ug/l	11	ND	ND	ND	ND	ND	64	ND	48	ND	ND	ND
Cadmium	ug/l	44	ND	ND	ND	ND	ND	72	ND	ND	ND	28	ND
Chromium	ug/l	130	ND	12	ND	17	ND	196	ND	88	ND	85	ND
Copper	ug/l	535	ND	ND	ND	12	ND	598	ND	478	ND	248	2.1
Lead	ug/l	26	ND	ND	ND	ND	ND	19	ND	17	ND	ND	ND
Mercury	ug/l	0.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	151	ND	15	ND	ND	ND	198	20	125	ND	72	ND
Silver	ug/l	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND	ND
Zinc	ug/l	533	ND	46	3.1	82	ND	726	ND	630	ND	341	ND
GROUND-WATER CONDITIONS													
Chloride	mg/l	< 1	26.8	22	24.7	22.5	25.7	22.9	26	41.5	44.6	27.9	28.6
Sulfate as SO4	mg/l	39	28	20	23	26	21	81	48	45	39	33	25
Specific Conductance	us/cm	487	494	494	492	490	492	553	558	653	711	625	486
MISCELLANEOUS PARAMETERS													
Acetone	ug/l	19.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aluminum	mg/l	105	.05	2.7	.05	2.6	.05	291	0.1	217	.05	74.4	.05
Ammonia as N	mg/l	3.4	0.2	0.4	< .2	< .2	0.2	< .2	.06	< .2	< .2	< .2	0.2
Barium	ug/l	810	127	68	31	60	31	937	72	1080	33	493	179
Bicarbonate as CaCO3	mg/l	200	190	220	210	210	210	250	230	470	270	340	270
Calcium	mg/l	58.4	41	44	44.5	44.5	44.8	117	68.6	568	64	146	61.9
Cobalt	ug/l	106	ND	ND	ND	ND	ND	150	ND	152	ND	52	ND
Iron	mg/l	231	0.05	3.67	0.01	3.54	ND	379	0.05	519	ND	150	0.02
Magnesium	mg/l	49.8	16.3	19.8	19.4	20.7	19.5	102	20.5	223	29.8	69.8	26.3
Manganese	mg/l	5.2	1.4	0.3	0.1	0.2	.05	9.3	3.4	7.5	.05	3.1	.52
2 Butanone	ug/l	[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/l	3.6	0.7	0.4	0.4	0.4	0.4	11.4	1.3	7.0	0.7	5.5	1.3
Sodium	mg/l	48.8	39	32.9	33	32.6	32.9	31.6	27.4	47.1	44.1	35.7	32.2
Sulfide as S	mg/l	< .5	< .05	0.07	0.08	0.06	< .05	0.32	< .05	5.3	< .05	0.6	< .05
Total Dissolved Solids (TDS)	mg/l	418	320	320	310	320	300	420	380	480	444	400	360
Vanadium	ug/l	326	5.9	17	13	17	13	939	24	1170	14	343	13

* Probable matrix effect

FIBERS PUBLIC SUPPLY WELLS SITE

Guayama, Puerto Rico

SUMMARY OF GROUND-WATER QUALITY, ROUNDS 1 AND 2

Table 1 (Continued)

PARAMETER	UNITS	PRASA-1		PRASA-2		PRASA-3		PRASA-3D		PRASA-4		PRASA-5		APS-2	
		ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2	ROUND 1	ROUND 2
Sample Date		8/27/87	12/07/87	8/26/87	11/24/87	8/27/87	11/20/87	8/27/87	11/20/87	8/26/87	11/24/87	9/1/87	11/23/87	8/27/87	11/18/87
PRIORITY POLLUTANT VOLATILES GC/MS															
Chlorodibromomethane	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	5.3	ND	ND	ND	ND	ND
Chloroform	ug/l	33	44	ND	ND	ND	BDL	ND	ND	71	14	6	9	ND	ND
Dichlorobromomethane	ug/l	13.3	8	ND	ND	ND	ND	ND	ND	19.4	BDL	ND	ND	ND	ND
Methylene chloride	ug/l	BDL	ND	ND	ND	BDL	ND	BDL	ND	BDL	BDL	10	BDL	ND	ND
Tetrachloroethylene	ug/l	ND	ND	BDL	6	118	61	89.7	43	8.5	42	10	ND	ND	ND
1,2-trans-dichloroethylene	ug/l	ND	ND	ND	ND	6.5	BDL	5.9	BDL	ND	BDL	ND	ND	ND	ND
Trichloroethylene	ug/l	ND	ND	ND	ND	BDL	ND	BDL	BDL	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/l	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND	-	ND
Vinyl chloride	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT ACIDS GC/MS															
Phenol	ug/l	ND	ND	ND	ND	ND	ND	20	ND	ND	ND	ND	ND	ND	ND
PRIORITY POLLUTANT METALS															
Arsenic	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.1	ND	ND	ND
Chromium	ug/l	5.5	ND	7.2	ND	ND	ND	7	ND	ND	ND	176	ND	6.2	ND
Copper	ug/l	4.5	ND	290	ND	3.3	ND	2.6	ND	8.7	ND	144	ND	4.6	5.1
Lead	ug/l	ND	ND	38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	ug/l	41	ND	46	ND	48	51	46	54	37	6	ND	13	49	14
GROUND-WATER CONVENTIONALS															
Chloride	mg/l	12.7		27.7	25.6	22.7	18.2	23.4	18.2	24.4	22.7	30.8	29.9	23.4	18.4
Sulfate as SO4	mg/l	26		21	23	23	23	28	24	28	21	7	28	20	16
Specific Conductance	umhos	178		513	451	374	329	375	331	391	388	454	457	329	311
MISCELLANEOUS PARAMETERS															
Acetone	ug/l	ND	BDL	ND	ND	ND	ND	ND	BDL	21.9	ND	ND	BDL	ND	ND
Aluminum	mg/l	0.45	1.13	0.03	ND	ND	ND	0.04	ND	0.04	ND	0.06	.11	0.04	ND
Ammonia as N	mg/l	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	0.2	< .2	0.3
Barium	ug/l	8.1	9.2	12	11	16	15	15	13	34	31	20	13	18	17
Bicarbonate as CaCO3	mg/l	49	34	230	190	140	140	140	140	148	140	170	160	150	110
Calcium	mg/l	14.8	24.6	44.9	38.6	28.4	25.8	28.5	25.8	30.6	30.4	35.2	35.1	23.8	22.4
Cobalt	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	mg/l	0.14	0.01	0.29	0.04	0.15	0.17	1.45	0.17	0.90	0.22	0.99	0.04	0.04	ND
Magnesium	mg/l	4.2	3.5	19.9	14.7	12.9	11.6	11.1	11.5	14	13.9	14.1	12.9	11.1	10.3
Manganese	mg/l	0.017	.01	0.012	.005	0.009	.09	0.1	.09	0.025	.06	0.038	.02	ND	.001
2-butanone	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	mg/l	0.8	0.8	0.5	0.4	0.4	0.7	0.3	0.7	0.3	0.4	0.3	0.5	0.5	0.6
Sodium	mg/l	10.7	9.6	34	34.1	29	27.6	29	27.2	28.9	28.8	35.3	28.9	27.4	27
Sulfide as S	mg/l	< .05	0.09	< .05	0.05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	0.07
Total Dissolved Solids (TDS)	mg/l	138	148	330	270	250	200	240	180	250	220	290	230	230	200
Vanadium	ug/l	ND	5.3	ND	9.3	ND	4.6	ND	4.9	ND	4.3	3.1	6.6	ND	8.2

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 2
ROUND 3 SUMMARY - VOLATILE ORGANIC COMPOUNDS
SAMPLES COLLECTED IN FEBRUARY AND APRIL, 1990

Well No.	Sample Description	Tetrachloroethene	Trichloroethene	Trichlorofluoromethane	Cis-1,2-Dichloroethene	Trans-1,2 Dichloroethene	Chloroform
PRASA 1		ND	ND	ND	ND	ND	ND
PRASA 3		160E	5.1	4.2	9.7	9.7	ND
PRASA 3(DL)	Lab diluted	150/10	10J/10	10J/10	ND/10	ND/10	ND/10
PRASA 5	Lab diluted-1	120/10	ND/10	ND/10	8.4J/10	10J/10	8.1J/10
PCNU-1	February-Lab diluted	ND/50	13J/50	ND/50	12J/50	ND/50	ND/50
PCNU-1	April-2, 3	ND	ND	ND	ND	ND	ND
PCNU-2	February-Lab diluted	ND/10	ND/10	ND/10	ND/10	ND/10	ND/10
PCNU-2	April-Lab diluted	140E/5.0	2.5J/5.0	1.8J/5.0	7.4/5.0	7.4/5.0	ND/5.0
PCNU-2(DL)	April-Lab diluted	130/10	ND/10	ND/10	ND/10	ND/10	ND/10
PCNU-2D	April-Duplicate	140E	2.7	7.2	7.4	7.4	ND
PCNU-2D	April-Duplicate-Lab diluted	150/10	ND/10	ND/10	ND/10	ND/10	ND/10
PCNU-4		3.0	0.19J	ND	ND	ND	ND
PCNU-5	February-Lab diluted	ND/50	ND/50	ND/50	ND/50	ND/50	ND/50
PCNU-5	April 2	15	ND	ND	ND	ND	1.5
PCPI-1	2	94E	2.1	1.7	7.9	7.9	ND
PCPI-1(DL)	Lab diluted	160/10	ND/10	ND/10	ND/10	ND/10	ND/10
PCPI-2	Lab diluted	240/25	5.2J/25	ND/25	17J/25	17J/25	ND/25
AUPI-2		ND	ND	ND	ND	ND	ND
AUPI-5	February	0.16J	ND	ND	ND	ND	ND
AUPI-5	April	ND	ND	ND	ND	ND	ND
ANP MW-1	Lab diluted	45/5.0	ND/5.0	ND/5.0	2.2J/5.0	2.2J/5.0	ND/5.0
ANP MW-2		5.6	ND	ND	ND	ND	ND
Core 2A	Domestic	ND	ND	ND	ND	ND	ND
Core 2		5.4	0.18J	0.12J	0.36J	ND	0.23J
Core 3	3	11	0.69J	ND	0.86J	ND	ND
Core 5	1	6.1	0.14J	ND	ND	ND	1.8
Core 6	3	ND	2.8	ND	3.0	2.1	5.1
Core 7		0.93J	ND	ND	ND	ND	ND
SKF 721		2.0	ND	ND	ND	ND	2.0
SKF 722	4	1.9	0.21J	ND	ND	ND	0.63J

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE .2
ROUND 3 SUMMARY - VOLATILE ORGANIC COMPOUNDS
SAMPLES COLLECTED IN FEBRUARY AND APRIL, 1990
(Continued)

Well No.	Sample Description	Tetrachloroethane	Trichloroethane	Trichlorofluoromethane	Cis-1,2-Dichloroethene	Trans-1,2 Dichloroethene	Chloroform
USGS A-1		0.90J	ND	ND	ND	ND	0.68J
USGS A-2		3.0	ND	ND	ND	ND	ND
USGS C-1		2.0	ND	ND	ND	ND	0.15J
USGS C-2		2.0	ND	ND	ND	ND	0.26J
USGS C-20	Duplicate	3.0	ND	ND	ND	ND	0.32J
113	Irrigation Well	ND	ND	ND	ND	ND	ND

Notes: Analytical results in micrograms per liter (ug/l) - detection limits 1.0 ppb unless otherwise identified by a / with detection limit following, such as 150/10 meaning detected value of 150 ug/l with a 10 ug/l detection limit.

Other Compounds Detected

1. Carbon Tetrachloride
2. Carbon Disulfide
3. 1-1-1 Trichloroethane
4. Chlorobenzene

J = Estimated value below detection limit.
E = Estimated value, outside initial calibration.
ND = Not detected.
All values in micrograms per liter.

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 3
ROUND 3 SUMMARY - METAL SAMPLES COLLECTED IN FEBRUARY AND APRIL, 1990

Analyte	PRASA-1		PRASA-3		PRASA-5		PCMW-1		PCMW-2	
	U	F	U	F	U	F	U	F	U	F
Aluminum	51.6	32.5	32.5	32.5	32.5	32.5	34,700	32.5	2,070	32.5
Antimony	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
Arsenic	0.8	0.8	0.8	0.8	0.8	0.8	4.1	1.0	0.8	0.8
Barium	9.3	8.5	19.0	11.0	17.0	10.8	271.0	60.7	41.5	25.5
Beryllium	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.3	0.3
Cadmium	1.0	1.0	6.8	1.0	1.3	1.0	1.0	1.0	1.0	1.0
Calcium	32,400	32,200	26,800	27,200	39,900	38,900	48,800	42,500	45,100	48,000
Chromium	3.8	3.8	3.8	3.8	3.8	3.8	117.0	3.8	80.5	3.8
Cobalt	6.8	6.8	6.8	6.8	6.8	6.8	25.5	6.8	6.8	6.8
Copper	67.1	41.1	3.8	3.5	43.2	12.6	185.0	3.5	14.8	3.5
Iron	1,260	511.0	20,000	48.2	8,370	48.2	67,000	48.2	4,190	48.2
Lead	12.5	5.2	6.0	1.6	7.4	1.1	38.0	1.1	10.5	1.1
Magnesium	15,400	15,200	12,300	12,700	16,300	15,900	28,400	17,200	19,100	20,300
Manganese	61.8	42.2	131.0	12.7	145.0	8.5	2,740	1,560	398.0	143.0
Mercury	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1
Nickel	2.0	2.0	3.9	2.0	2.0	2.0	111.0	3.9	110.0	24.8
Potassium	530.0	515.0	322.0	213.0	217.0	236.0	1,560	395.0	377.0	300.0
Selenium	0.7	0.7	0.7	0.7	1.1	0.7	0.7	0.7	0.7	0.7
Silver	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Sodium	37,300	37,500	25,600	26,600	33,000	32,800	41,000	39,600	30,800	35,000
Thallium	1.9	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4
Vanadium	8.0	3.9	8.4	3.9	15.2	4.4	154.0	3.9	16.7	4.9
Zinc	13.3	21.8	52.6	25.9	122.0	14.9	163.0	25.5	174.0	43.1

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 3
ROUND 3 SUMMARY - METAL SAMPLES COLLECTED IN FEBRUARY AND APRIL, 1990
(Continued)

Analyte	PCMW-4		PCMW-5		AWPI-5		USGS A-1		USGS A-2	
	U	F	U	F	U	F	U	F	U	F
Aluminum	23,700	32.5	13,100	32.5	32.5	32.5	524.0	32.5	9,140	1,880
Antimony	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
Arsenic	4.1	0.8	2.1	0.8	0.8	0.8	0.8	0.8	1.5	0.8
Barium	131.0	36.2	91.5	75.1	16.8	14.0	18.7	14.5	79.1	44.7
Beryllium	1.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cadmium	1.0	1.0	8.8	1.5	1.0	1.3	1.7	1.0	5.8	1.0
Calcium	130,000	77,500	57,100	46,600	21,100	19,700	40,400	41,000	43,400	44,100
Chromium	1,140	3.8	33.7	21.6	3.8	3.8	3.8	3.8	5.0	3.8
Cobalt	39.0	6.8	11.0	6.8	6.8	6.8	6.8	6.8	8.1	6.8
Copper	91.1	3.5	61.3	3.5	6.2	6.3	10.5	3.7	37.3	11.1
Iron	61,600	48.2	26,800	48.2	48.2	48.2	1,620	48.2	16,400	2,490
Lead	35.3	1.1	3.6	1.1	1.1	1.1	5.9	1.2	1.1	3.7
Magnesium	54,000	39,400	27,700	23,400	9,900	9,310	16,800	17,100	21,200	19,600
Manganese	1,000	58.3	722.0	21.8	1.3	1.3	41.6	17.5	461.0	79.2
Mercury	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nickel	337.0	11.3	46.0	3.3	2.0	2.0	4.6	2.0	6.0	2.0
Potassium	1,260	385.0	1,630	1,350	490.0	649.0	872.0	911.0	647.0	240.0
Selenium	0.7	5.3	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Silver	5.1	5.1	7.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Sodium	44,400	55,100	24,900	32,600	23,200	21,900	30,200	31,600	28,200	30,400
Thallium	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.5	1.1
Vanadium	154.0	6.6	77.9	9.6	4.7	5.1	13.0	6.8	49.8	12.4
Zinc	110.0	3.3	285.0	9.8	16.5	9.3	221.0	127.0	60.0	16.1

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 3
ROUND 3 SUMMARY - METAL SAMPLES COLLECTED IN FEBRUARY AND APRIL, 1990
(Continued)

Analyte	USGS G-1		USGS G-2		USGS G-2 (DUPLICATE)		WELL 113	
	U	F	U	F	U	F	U	F
Aluminum	1,410	32.5	10,700	32.5	14,800	32.5	32.5	32.5
Antimony	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
Arsenic	0.8	0.8	0.8	0.8	2.3	0.8	0.8	0.8
Barium	27.3	19.0	93.4	33.7	109.0	34.9	4.3	2.5
Beryllium	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Cadmium	1.0	1.0	6.8	1.0	9.2	1.0	1.0	2.0
Calcium	35,600	35,100	51,800	50,800	55,300	53,100	44,100	41,600
Chromium	8.3	3.8	5.8	3.8	10.3	3.8	3.8	3.8
Cobalt	6.8	6.8	8.9	6.8	13.7	6.8	6.8	6.8
Copper	10.6	3.5	41.6	3.5	53.5	3.5	12.9	4.5
Iron	2,920	48.2	22,500	48.2	28,600	48.2	48.2	48.2
Lead	30.3	3.2	2.9	1.1	2.2	1.1	1.1	1.1
Magnesium	13,500	13,100	20,000	16,500	22,000	17,200	15,500	14,600
Manganese	112.0	36.8	606.0	1.3	771.0	1.5	1.3	1.3
Mercury	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nickel	4.1	2.0	2.0	2.0	7.4	2.0	2.0	2.0
Potassium	1,350	1,250	940.0	200.0	1,190	180.0	304.0	407.0
Selenium	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Silver	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Sodium	28,100	28,700	23,200	24,700	23,900	25,100	28,500	27,300
Thallium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2
Vanadium	11.9	3.9	74.6	4.7	94.1	4.8	9.3	8.2
Zinc	463.0	270.0	59.1	8.0	81.0	3.7	15.8	8.1

Notes: U - Unfiltered
F - Filtered
All values in micrograms per liter.

TABLE 4

SUMMARY OF ENVIRONMENTAL FATE AND TRANSPORT MECHANISMS
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Chemical Class	Fate and Transport Summary
Chlorinated Aliphatic Hydrocarbons	• Volatilization and biotransformation/biodegradation are potentially significant fate/transport processes. • Tetrachloroethene volatilization half-lives for typical bodies of water: ponds, 7 days; river, 1.4 days; lakes, 5.6 days. • Generally moderately mobile in surface water and groundwater (moderately adsorbed to soils and sediments). Experimentally measured soil sorption coefficients (Koc) for tetrachloroethene range from 132 to 364. • Hydrolysis may occur for saturated aliphatics (alkanes). • Biodegradation and hydrolysis may be the most important transformation processes for tetrachloroethene.
Non-Halogenated Phenols	• Biotransformation/biodegradation and soil-catalyzed oxidation are potentially significant fate processes. • Volatilization is not significant. Phenols are transported in air via airborne particulate soils or dusts. • Mobile in groundwater and surface water. • Bioaccumulation is not significant. • Hydrolysis/photolysis is not significant.
Metals	• Solubility and mobility are dependent on chemical speciation and form (carbonate, oxide, etc.). • Adsorb to soil organic matter and clay. • Cations are mobile in groundwater in an acidic environment, while anionic forms are mobile in alkaline environments. • Mobile in surface water, but will precipitate out in an oxidizing environment. • Some metals are bioaccumulative. • Volatilization is not significant. Transported in air via airborne particulate soils or dusts.

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 5
SEDIMENT SAMPLES FROM SETTLING LAGOONS
AND STORMWATER RETENTION AREA
COLLECTED IN FEBRUARY AND APRIL, 1990
METALS ANALYSES

Analyte	E-1	E-2	M-1	M-2	M-2(D)	W-1	W-2
Aluminum	20,200	16,100	10,500	13,500	15,100	23,800	14,000
Antimony	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Arsenic	3.4	4.4	1.9	2.9	2.9	2.6	3.2
Barium	118.0	68.9	120.0	105.0	84.6	107.0	64.2
Beryllium	0.5	0.5	0.4	0.6	0.6	0.6	0.4
Cadmium	13.3	11.8	7.5	12.8	12.3	15.3	9.8
Calcium	5,720	7,970	85,900	7,590	5,040	5,240	4,380
Chromium	417.0	2,110	172.0	60.7	66.1	830.0	64.9
Cobalt	21.5	14.9	11.1	18.7	16.7	23.4	15.7
Copper	147.0	124.0	88.8	92.2	75.1	124.0	64.7
Iron	48,500	35,800	24,700	34,600	43,000	54,600	33,800
Lead	22.2	17.1	21.2	3.4	3.2	18.3	3.5
Magnesium	10,500	9,860	10,100	9,850	8,440	11,400	7,100
Manganese	652	528	565	754	607	740	616
Mercury	0.2	0.3	2.3	0.1	0.1	0.1	0.07
Nickel	11.6	9.2	15.5	10.8	19.2	10.9	6.1
Potassium	1,780	957	722	594	516	869	745
Selenium	0.5	0.3	0.1	0.4	0.4	0.1	0.3
Silver	1.5	2.0	3.2	1.4	2.2	2.0	1.0
Sodium	390	103	647	150	131	148	119
Thallium	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Vanadium	132.0	119.0	68.5	134.0	139.0	154.0	96.4
Zinc	335.0	540.0	144.0	116.0	104.0	494.0	86.9

Notes: (D) = Duplicate sample
All values in milligrams per kilogram.

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

TABLE 6
SEDIMENT SAMPLES FROM SETTLING LAGOONS
AND STORMWATER RETENTION AREA
COLLECTED IN FEBRUARY AND APRIL, 1990
PESTICIDES/PCB'S ANALYSES

Sample No.	ETC I.D. No.	Aroclor-1260	Aroclor-1254
E-1	CA2980	0.20	ND
E-2	CA2986	ND	ND
M-1	CA2981	0.13	ND
M-2	CA2982	ND	ND
M-2(D)	CA2983	ND	ND
W-1	CA2985	1.1	ND
W-2	CA3573G	0.56	0.29

Notes: (D) = Duplicate sample
ND = Not detected
All values in milligrams per kilogram.
Only compounds above detection limits are shown.

TABLE 7

SOIL BORING ANALYTICAL SUMMARY FOR SOIL DISPOSAL AREA
RANGE OF POSITIVE DETECTIONS
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Parameter	Shallow Sample Composite	2- to 4-Foot Depth	Deep Sample Composite 4- to 6-Foot Depth 6- to 8-Foot Depth	Ditch Sample 1/2	Background Samples	Eastern United States Background
INORGANICS (mg/kg)						
Arsenic	1.7BN-3.8	1.3BN-6.0	1.5BN-6.5	3.4N/6.1N	2.3N-2.8N	<0.1-73 (7.4)
Chromium	49.0J4-727J4	11.8J4-85.5J4	10.8J4-70.1J4	13.9J4/38.9	13.2-34.6	1-1,000 (52)
Copper	75.4J4-83.2J4	39.8J4-98.5J4	61.1J4-95.4J4	78.2J4/99.1J4	76.1-104	<1-700 (22)
Lead	9.7-13	2.3-20.7	0.57B-4.1	3.7/19.3	5.9-7.7	<10-300 (17)
Mercury	ND (0.1U)-0.09	0.04B-0.46	ND (0.04U)-0.05B	ND (0.1U)/0.07	ND (0.1U) 0.09	0.01-3.4 (0.12)
Nickel	6.5BJ4-7.5BJ4	4.5BJ4-8.8J4	3.2BJ4-8.8J4	7.8J4/12.0J4	6.7B-8.3	<5-700 (18)
Selenium	ND (0.38U-0.41U)	ND (0.36UN)-0.72B	ND (0.33UN)-0.64B	ND (0.41UN/0.43UN)	ND (0.35UN-0.39UN)	<0.1-3.9 (0.65)
Thallium	ND (0.38U-0.41U)	ND (0.36UN-0.67U)	ND (0.37U)-0.46N6	ND (0.41U-0.43U)	ND (0.35U-0.39U)	2.2-21 (8.6)
Zinc	97.2J4-338J4	49.4J4-185J4	44.0J4 90.2J4	146J4/186J4	86.3-115	5-2,900 (52)
Cyanide	ND (0.54U-0.59U)	ND (0.53U-0.67U)	ND (0.54U-0.64U)	ND (0.51U/ 0.57U)	ND (0.52U-0.58U)	----
POLYCHLORINATED BIPHENYL COMPOUNDS (PCBs) (µg/kg)						
Aroclor-1248	ND (U80)-790	ND (U80)	ND (U80)	ND (U80)	ND (U80)	----
Aroclor-1254	210-1,300	ND (U160)-180J	ND (U160)	ND (U160)	ND (U160)	----
Aroclor-1260	ND (U160)	ND (U160)-170J	ND (U160)	180/1,700	ND(U160)-120J	----
ASBESTOS						
Chrysotile	2-4%	2-4%	ND	NAvail	ND	----
Amosite	2-4%	2-4%	ND	NAvail	ND	----

---- - Background value not available.
NAvail - Sample results are not available, as yet.
'B' - Indicates that analytical result is between instrument detection limit and contract required detection limit.
'N' - Indicates that spiked sample recovery is within control limits. Data are validated as estimated values.
'U' - Indicates the sample was analyzed for but not detected. The value presented is the sample quantitation limit.
'J4' - Data are validated as estimated values biased high.

Table 8

REGULATORY REQUIREMENTS AND DOSE RESPONSE PARAMETERS
PIERRE MUNICIPAL SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Site Contaiment	EPA SDWA Standards (µg/L)			EPA Drinking Water Health Advisories (Status) (µg/L)	EPA DWEL (µg/L) (10)	Federal Ambient Water Quality Criteria (µg/L)		CSF/NOE (mg/kg-day)$^{-1}$ (11)	RfD (mg/kg-day) (12)	Puerto Rico Water Quality Standards
						Human Health	Aquatic Life			
	MCLGDWR (7)	MCL (Status) (8)	MCLG (Status) (9)			Ingestion of Water/ Ingestion of Water plus Consumption of Aquatic Life/ Ingestion of Aquatic Life Only	Acute/Chronic			
Tetrachloroethene	NA	5 (P) (1)	0 (P) (1)	1-/10-day, child: 2,000 Longer-term, child: 1,000 Longer-term, adult: 5,000 (1,4)	500 (1)	NA/ 0.69/ 0.85 (4,21)	5,280/ 450 LEC (5,13)	Oral, B2: 5.1x10^{-2} Inh,B2: 3.3x10^{-3} (3)	Oral, subchronic: 1x10^{-1} Oral chronic: 1x10^{-2} (3)	50
Trichloroethene	NA	5 (P) (1)	0 (P) (1)	NA	300 (1)	NA/ 2.7/ 80.7 (4) (4,6)	2,000/ NA LEC (5,13)	Oral, B2: 1.1x10^{-2} Inh,B2: 1.7x10^{-2} (3,4)	NA	50
Vinyl chloride	NA	2 (P) (1)	0 (P) (1)	1-/10-day, child: 3,000 Longer-term, child: 10 Longer-term, adult: 50 (1)	NA	0.015/ 2/ 525 (5,10)	NA	Oral, A: 2.3 Inh, A: 2.95x10^{1} (3)	NA	10
Carbon tetrachloride	NA	5 (P) (1)	0 (P) (1)	1-day, child: 4,000 10-day, child: 200 Longer-term, child: 70 Longer-term, adult: 300 (1)	30 (1)	NA/ 0.4/ 0.96 (4,20)	35,200 (5,20)	Oral and Inh, B2: 1.3x10^{-1} (3)	Oral, subchronic: 7x10^{-3} Oral, chronic: 7x10^{-4} (3)	NA
Trichlorofluoro-methane	NA	NA	NA	NA	NA	NA	NA	NA	Oral, chronic: 3x10^{-1} Inh: 2x10^{-1} (3)	NA

Table 8

REGULATORY REQUIREMENTS AND DOSE RESPONSE PARAMETERS
PIERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO
PAGE TWO

Site Contaminant	EPA SDWA Standards (µg/L)			EPA Drinking Water Health Advisories (Status) (µg/L)	EPA DWEL (µg/L) (10)	Federal Ambient Water Quality Criteria (µg/L)		CSF/WOE (mg/kg-day)$^{-1}$ (11)	RfD (mg/kg-day) (12)	Puerto Rico Water Quality Standards
						Human Health	Aquatic Life			
	MCLG (7)	MCL (Status) (8)	MCLG (Status) (9)			Ingestion of Water/ Ingestion of Water plus Consumption of Aquatic Life/ Ingestion of Aquatic Life Only	Acute/Chronic			
Chloroform	100(1)	NA	NA	NA	NA	NA/ 0.19/ 15.7 (6,28)	28,900/ 1,240 (5,28)	Oral, B2: 6.1×10^{-3} Inh, B2: 8.1×10^{-2}	Oral, subchronic: 1×10^{-2} Oral, chronic: 1×10^{-2} (3)	NA
1,2-dichloroethene (CIS)	NA	70 (P) (1)	70 (P) (1)	1-day child: 4,000 10-day child: 2,000 Longer-term, child/adult: 3,500 Lifetime: 70 (1)	400	NA	11,600/ NA LEC (5,13)	NA	NA	NA
1,2-dichloroethene (TRANS)	NA	100 (P) (1)	100 (P) (1)	1-day, child: 20,000 10-day, child: 1,000 Longer-term, child: 2,000 Longer-term, adult: 6,000 Lifetime: 100 (1)	600	NA	11,600/ NA LEC (5,13)	NA	Oral, chronic: 2×10^{-2} Oral, subchronic: 2×10^{-1} (3)(4)	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA/ 0.17/ 10.7 (4,6)	2,400/ NA (4,5)	Oral,C: 2.0×10^{-1} Inh,C: 2.0×10^{-1} (3)	NA	NA
Polychlorinated Biphenyl Compounds	NA	0.5 (P) (1)	0 (P) (1)	Longer-term, child: 1 Longer-term, adult: 4	NA	NA/ 0.079 ng/L/ 0.079 ng/L (6,20)	0.014/10 (28)	Oral, B2: 7.7 (3)	NA	1

Table 8

REGULATORY REQUIREMENTS AND DOSE RESPONSE PARAMETERS
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO
PAGE THREE

Site Contaminant	EPA SDWA Standards (µg/L)			EPA Drinking Water Health Advisories (Status) (µg/L)	EPA DWEL (µg/L) (10)	Federal Ambient Water Quality Criteria (µg/L)		CSF/WOE (mg/kg-day)$^{-1}$ (11)	RfD (mg/kg-day) (12)	Puerto Rico Water Quality Standards
						Human Health	Aquatic Life			
	MCLG (7)	MCL (Status) (8)	MCLG (Status) (9)			Ingestion of Water/ Ingestion of Water plus Consumption of Aquatic Life/ Ingestion of Aquatic Life Only	Acute/Chronic			
Asbestos	NA	7x10^{6} fibers/L >10 um (P) (1)	7x10^{6} fibers/L >10 um (P) (1)	NA	NA	NA	NA	A	NA	NA
Cadmium	10 (1)	5 (P) (1)	5 (P) (1)	1-/10-day, child: 40 Longer-term, child: 5 Longer-term, adult: 20 (1)	20 (1)	NA/10/NA (4)	3.9/1.1 (16,17)	Inh, B1: 6.1 (9)	Oral, chronic: 1x10^{-3} (food) 5x10^{-4} (water) (3)	NA
Chromium (Total)	50 (1)	100 (P) (1)	100 (P) (1)	1-/10-day, child: 1,000 Longer-term, child: 200 Longer-term, adult: 800 (1)	200 (1)	NA/50/NA (4)	16/11 Cr+6 (16)	Inh,: 4.1x10^{1} (VI)	Oral, chronic: 5x10^{-3}(VI) 1x10^{0} (III)	NA
Lead	50 (1)	TT (P) (1)	0 (P) (1)	NA	NA	NA/50/NA (4)	83/3.2 (16,18)	B2	Oral, chronic: 1.4x10^{-3} (15)	NA
Nickel	NA	100 (T) (1)	100 (T) (1)	1-/10-day, child: 1,000 Longer-term, child: 100 Longer-term, adult: 400 (1)	600 (1)	15.4/13.4 (15)	71/7.9 (19)	Inh: 1.7 (Ni Su) 0.84 (refinery dust) (3)	Oral, subchronic, chronic: 2x10^{-2} (3)	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	Oral, subchronic: 7x10^{-3} Oral, chronic: 7x10^{-3} (3)	NA

Table 8

REGULATORY REQUIREMENTS AND DOSE RESPONSE PARAMETERS
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO
PAGE FOUR

NA Not available or established.
P Proposed.
F Final.

(1) EPA - Drinking Water Regulations and Health Advisories Memorandum. April, 1990. Source: U.S. EPA Office of Drinking Water, Region III Philadelphia, Pennsylvania.
(2) 54 Federal Register 97, Monday, May 22, 1989 proposed rules.
(3) Health Effects Assessment Summary Tables. First/Second Quarter, 1990.
(4) Integrated risk information system, July 1989, July 1990.
(5) The values that are indicated as "LOC" are not criteria, but are the lowest effect levels found in the literature. (Values presented for fresh water or saltwater species whichever is lower.)
(6) For the maximum protection from the potential carcinogenic properties of the chemical, the ambient water concentration should be zero. However, zero may not be attainable at this time, so the recommended criteria represents a 1×10^{-6} estimated incremental increase of cancer risk over a lifetime.
(7) NIPDWR = National Interim Primary Drinking Water Regulations.
(8) MCL = Maximum Contaminant Level.
(9) MCLG = Maximum Contaminant Level Goal.
(10) EPA DWEL = Environmental Protection Agency Drinking Water Equivalent Level.
(11) CSF/WOE = Carcinogenic Potency Factor/Weight of Evidence Classification for Carcinogens.
(12) RfD = Reference Dose.
(13) 45 Federal Register 231, Friday, November 28, 1980. Page 79340, 79341, 79342.
(14) Agency for Toxic Substances and Disease Registry, U.S. Public Health Service. Toxicological Profile for Vinyl Chloride (DRAFT) January 1988. Note: two separate EPA documents cited.
(15) Superfund Public Health Manual, 1986, and updates.
(16) 50 Federal Register 145, Monday, July 29, 1985.
(17) Criteria presented assumes that the water hardness is 100 mg/L as $CaCO_3$. To calculate criteria for other hardness levels:

- $\{0.7852[\ln(\text{hardness})]-3.490\}$ chronic value
- $\{1.128[\ln(\text{hardness})]-3.828\}$ acute value

(18) Criteria presented assume that the water hardness is 100 mg/L as $CaCO_3$. To calculate criteria for the hardness levels:

- $\{1.266[\ln(\text{hardness})]-4.661\}$ chronic value
- $\{1.266[\ln(\text{hardness})]-1.416\}$ acute value

(19) 51 Federal Register 47, Tuesday, March 11, 1986.
(20) Quality Criteria for Water 1986. EPA 440/5-86-001. May 1986.
(21) Agency for Toxic Substances and Disease Registry, U.S. Public Health Service. Toxicological Profile for Tetrachloroethylene (DRAFT). December 1987.

Table 9

PROPOSED HUMAN EXPOSURE SCENARIOS FOR RISK ANALYSIS
FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Utilization of Site and Adjoining Area	Route of Exposure	Environmental Media	Example of Exposure	Exposure Model Assumptions	Comment
Commercial/industrial facility on property within the study area	Ingestion	Groundwater	Utilization of groundwater as a drinking water supply.	• Ingestion Rate - 1 L/day • Body Weight - 70 kg adult • Exposure occurs during adult working life (40 years). Exposure occurs 5 days/week for 50 weeks/year.	POSSIBLE CURRENT USE SCENARIO. Five commercial facilities currently use groundwater within the study area or adjoining the study area.
	Inhalation	Contaminants volatilized from groundwater.	Use of groundwater supply for showering.	• Foster and Chrostowski, 1987.	
	Dermal Contact	Contaminants in groundwater absorbed through the skin.	Use of groundwater supply for bathing.	• Body weight: 70 kg • Body surface area: 18,150 cm^2 • Duration of exposure: 20 min. • Exposure occurs 5 days/wk over a 40 year working lifetime. Reference: EPA, 1988a.	
Residential - Housing units built on property within the study area	Ingestion	Groundwater	Use of groundwater as a residential drinking water supply.	• Ingestion Rate - 2 L/day - Adult - 1 L/day - Child • Body Weight - 70 kg Adult - 10 kg - Child • Exposure occurs over a 70-year lifetime. • Absorption through gut is 100 percent.	POSSIBLE FUTURE USE SCENARIO. No contaminated wells are currently used as a domestic water supply source. However, contamination has occurred, in part, the shutdown of four public water supply wells. Contaminant migration may eventually affect other public water supply wells.
	Inhalation	Contaminants volatilized from groundwater.	Use of groundwater supply for showering.	• Foster and Chrostowski, 1987.	
	Dermal Contact	Contaminants in groundwater absorbed through the skin.	Use of groundwater supply for bathing.	• Body weight: 70 kg • Body surface area: 18,150 cm^2 • Duration of exposure: 20 min. • Exposure occurs daily over a 70-year lifetime. Reference: EPA, 1988a.	

Table 10 Maximum and average concentrations of PCE in the PRASA, monitoring, and private/industrial wells.

Sampling Round	PCE Concentration (ug/L)						Federal SDWA MCL ug/L
	PRASA Wells		RI Monitoring Wells		Private/Industrial Wells		
	Maximum	Average	Maximum	Average	Maximum	Average	
1	103	25	154	43	NA	NA	5
2	62	22	205	53.2	22	3.5	
3	150	90.2	240	83.2	11	2.7	

(1) The maximum concentrations presented for PCE in the PRASA and RI monitoring wells, Round 1 and Round 2, are the average of duplicate samples.
NA: Not analyzed.

Table 11 Alkane/alkene range and detected concentration in rounds 1, 2, and 3

Compound	Concentration (ug/L)						Maximum Contaminant Level (ug/L)
	Round 1		Round 2		Round 3		
	Range(1) Detected	Average	Range(1) Detected	Average	Range(1) Detected	Average	
Trichloroethene	2.5-17.7	2.3	2.5	0.44	0.14-13	1.6	5 (F)
Trans-1,2-Dichloroethene	2.5-14.2	2.3	2.5-17	1.3	2.1-17	2.8	100 (P)
cis-1,2-Dichloroethene	ND	ND	ND	ND	2.2-12	3.0	70 (P)
Vinyl chloride	23.1	3.1	28	1.2	ND	ND	2 (F)
1,1,2,2-Tetrachloroethane	ND	ND	2.5	0.3	ND	ND	NA
Methylene chloride	ND	ND	110	4.8	ND	ND	5 (T)
Carbon tetrachloride	ND	ND	ND	ND	0.13-10	0.45	5 (F)
1,1,1-Trichloroethane	ND	ND	2.5	0.1	0.11-0.26	0.06	200 (F)

ND: Not detected
NA: Not available
(1) The range of Positive Detected is presented.

P: Proposed
F: Final
T: Tentative

Table 12

HAZARD INDICES (HI) RESULTING FROM POTENTIAL FUTURE USE OF CONTAMINATED GROUND WATER BY RESIDENTS AND WORKERS.

SAMPLING ROUND	RESIDENT HI	WORKER HI
ROUND 1 (MAXIMUM)	12.5	4.2
ROUND 2 (MAXIMUM)	0.87	0.29
ROUND 3 (95% UCL)	2.6	NA

NA Not Available

Table 13

CANCER RISKS RESULTING FROM POTENTIAL FUTURE USE OF CONTAMINATED GROUND WATER BY RESIDENTS AND WORKERS.

SAMPLING ROUND	RESIDENT RISK	WORKER RISK
ROUND 1 (MAXIMUM)	2×10^{-3}	4×10^{-4}
ROUND 2 (MAXIMUM)	2×10^{-3}	5×10^{-4}
ROUND 3 (95% UCL)	1×10^{-4}	NA

NA Not Available

Table 14

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Federal Chemical-Specific Standards Considered for Ground-Water Clean-up Criteria

Compound	CAS number	Safe Drinking Water Act		
		MCL's[1/] (mg/l)	MCLG's[2/] (mg/l)	SMCL's[3/] (mg/l)
Carbon Tetrachloride	56-23-5	0.005	0	NR
Chloroform	67-66-3	0.1*	NR	NR
Enflurane (1-Chloro-1,1,2-trifluoroethyl difluoromethyl ether)	13838-16-9	NR	NR	NR
Isoflurane (1-Chloro-2,2,2-trifluoroethyl difluoromethyl ether)	26675-46-7	NR	NR	NR
Tetrachloroethylene	127-18-4	0.005+	0+	NR
Trichloroethylene	79-01-6	0.005	0	NR
Vinyl Chloride	75-01-4	0.002	0	NR

1/ 40 CFR § 141.11, 141.12, 141.61 and 141.62.
2/ 40 CFR § 141.50.
3/ 40 CFR § 143.3.
NR Not regulated.
* Total Trihalomethanes cannot exceed 0.1 mg/l.
+ "National Primary Drinking Water Regulations; Final Rule", Federal Register, Volume 56, Number 20, January 30, 1991, effective July 30, 1992.

phil.tbl/phil table disk

Table 15

FIBERS PUBLIC SUPPLY WELLS SITE
GUAYAMA, PUERTO RICO

Puerto Rico Chemical-Specific Standards Considered for Ground-Water Clean-up Criteria

Compound of concern	CAS number	Puerto Rico Standard[1/ 2/]	
		Drinking water PRMCL's (mg/l)	PRMCLG's (mg/l)
Carbon Tetrachloride	56-23-5	0.005	0
Chloroform	67-66-3	0.05*	0
Enflurane (1-Chloro-1,1,2-trifluoroethyl difluoromethyl ether)	13838-16-9	0.05*	0
Isoflurane (1-Chloro-2,2,2-trifluoroethyl difluoromethyl ether)	26675-46-7	0.05*	0
Tetrachloroethylene	127-18-4	0.005	0
Trichloroethylene	79-01-6	0.005	0
Vinyl Chloride	75-01-4	0.002	0

1/ Regulation to Protect the Purity of the Potable Waters of Puerto Rico, Regulation of the Secretary of Health No. 50, Department of State Regulation No. 3000 of June 23, 1983.
2/ Amendments Adopted to Regulation of the Secretary of Health No. 50 of December 8, 1989, Department of State Regulation No. 4080 of December 13, 1989.
NR = Not regulated.
* = Maximum permissible concentration for any single organic chemical if not specifically listed as being toxic at lower concentrations. The total allowed for a combination of these contaminants is 0.100 mg/l.

COMMONWEALTH OF PUERTO RICO
LETTERS OF CONCURRENCE

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

APPENDIX C

Carole

COMMONWEALTH OF PUERTO RICO / OFFICE OF THE GOVERNOR

Environmental Quality Board

September 17, 1991

Kathleen Callahan
Director
Emergency and Remedial
Response Division
Environmental Protection Agency
Region II - Room 737
26 Federal Plaza
New York, New York 10278

RE: ENVIRONMENTAL PROTECTION AGENCY (EPA) DECLARATION FOR RECORD OF DECISION OF FIBERS PUBLIC SUPPLY WELLS SITE, GUAYAMA, PUERTO RICO

Dear Ms Callahan:

The Superfund Core Program of the Air Quality Area, received the Declaration for the Record of Decision of Fibers Public Supply Wells Site, Guayama, Puerto Rico for evaluation and comments. This document, prepared by the Environmental Protection Agency (EPA), presents the selected remedial action for this site.

The document explains the factual and legal basis for selecting the remedy or alternative previously selected on the Preferred Remedial Action Plan (PRAP).

The evaluation and selection of the preferred alternative for cleaning up a contaminated site will provide the best balance among the alternative selected and the nine criteria which EPA uses to evaluate them. This nine criteria can be resumed as follows:

1. Overall protection of Human Health and the Environment

2. Compliance with the Applicable or Relevant and Appropriate Requirements (ARARs)

3. Long-term effectiveness and permanence

4. Reduction of toxicity, mobility or volume

OFFICE OF THE BOARD: NATIONAL BANK PLAZA / 431 PONCE DE LEON AVE. / SANTURCE, PUERTO RICO 00910
P.O. BOX 11488 / SANTURCE, PUERTO RICO 00910 / TELEPHONE: 767-8181

5. Short-term effectiveness

6. Implementability

7. Cost

8. State Acceptance

9. Community Acceptance

The Superfund Law, (CERCLA), requires that any selected remedy for a site must be protective to human health and the environment, cost effective and in accordance with ARARs to be in compliance.

The selected alternative for groundwater contamination is Alternative 3-III: Five extraction Wells and Treatment with Discharge to the Irrigation Canal.

The selected Alternative for the Soil Disposal Area (SDA) is Alternative 4: Excavation of SDA and Disposal at an Authorized Landfill. Alternative 4 will provide the best overall protection because it will eliminate the presence of asbestos at the Site through excavation and off-site disposal, and no residual contaminated soil will remain at the Site.

The Puerto Rico Environmental Quality Board (PREQB) concurs on the selected alternatives and request that EPA inform EQB of all future activities at the site.

PREQB also requests that the following specific information be provided as it becomes available:

1. Details referring to the implementation of Alternative 4: "Excavation of SDA and Disposal at an authorized landfill" including :

   a. Re-evaluation of asbestos quantity to be excavated

   b. Soil characterization and asbestos classification

   c. Asbestos quantity-disposal feasibility on an approved landfill in Puerto Rico

d. Detail description and certification of asbestos transporter

e. Any other additional information that may be helpful to ensure that the Responsible Parties are in compliance with EPA and EQB standards and regulations for asbestos management or disposal

Is there any question about this comments please contact me at phone number (809)767-8056 or Miss Eileen C. Villafañe of the Superfund Core Program at (809)767 8071.

Cordially,

Pedro A. Maldonado, Esq.
Acting Chairman

cc: Eng. Adalberto Bosque
Mr. Melvin Hauptman
Miss Eileen C. Villafañe
Adrew Praschak, Esq.

COMMONWEALTH OF PUERTO RICO / OFFICE OF THE GOVERNOR

Environmental Quality Board

September 26, 1991

William McCabe
Deputy Director
New York/Caribbean Programs
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

Dear Mr. McCabe:

The Environmental Quality Board (EQB) received and evaluate the new changes to be included in the Record of Decision (ROD) of Fibers Public Supply Wells Site at Guayama Municipality based on the public comment period. This changes states:

> "The treated groundwater will be discharged to the PREPA irrigation canal where it will also serve to recharge the aquifer unless it is determined during the Remedial Design (RD) stage that a more appropriate option exists for all or portions of the treated groundwater. In any event, the discharge must provide a beneficial use of the water."

EQB concurs with the changes added to the ROD and requests that the Environmental Protection Agency (EPA) inform and consult EQB of any future decisions as to method of use of the treated water to be performed at the site.

Is there any question, please contact me or Mrs. Carmen Carrón at phone number (809)767-8056.

Cordially,

Pedro A. Maldonado, Esq.
Acting Chairman

cc: Mr. Melvin Hauptman
Eng. Adalberto Bosque
Andrew Praschak, Esq.
Mrs. Carmen Carrón
Miss Eileen C. Villafañe

ADMINISTRATIVE RECORD INDEX

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

APPENDIX E

Document Number: FIB-001-0080 To 0180 Date: 12/10/86

Title: Addendum to Site Operations Plan, Remedial Investigation/Feasibility Study, Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0277 To 0428 Parent: FIB-001-0276 Date: 04/01/86

Title: Site Operations Plan. Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0596 To 1116 Date: 04/15/87

Title: Analytical Assessment of Excavated Soils Contamination Report (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: DATA
Author: none: Dames & Moore
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1118 To 1265 Parent: FIB-001-1117 Date: 11/01/89

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Guayama, Puerto Rico

Type: PLAN
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1267 To 1314 Parent: FIB-001-1266 Date: 10/01/85

Title: Work Plan Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field. Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1315 To 1496 Date: 11/01/90

Title: Report for the Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume I - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1497 To 1715 Date: 11/01/90

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume II, Appendices - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1716 To 1881 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume I. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1882 To 2306 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume II. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-002-0568 To 0997 Date: 04/01/91

Title: Interim Feasibility Study Report - Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Author: none: Leggette, Brashears & Graham
Recipient: none: various parties associated with the site

Document Number: FIB-002-1000 To 1000 Date: 07/23/91

Title: (News Announcement: Notice of Public Meeting and Opportunity to Comment on the Proposed Plan for Fibers Public Supply Wells - in Spanish)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: El Nuevo Dia

Document Number: FIB-002-0505 To 0511 Date: 04/19/85

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Alivernini, John M.: Ayerst-Wyeth Pharmaceuticals, Inc.
Recipient: Diamond, Lawrence W.: US EPA

Document Number: FIB-001-0181 To 0181 Date: 11/20/86

Title: (Letter forwarding the proposed Quality Assurance/Quality Control plan)

Type: CORRESPONDENCE
Author: Bly, Herbert A.: American Home Products Corporation
Recipient: none: US EPA
Attached: FIB-001-0182

Document Number: FIB-002-0998 To 0999 Date: 04/18/91

Title: (Letter noticing Anaquest, Inc., that it may be a responsible party at the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Callahan, Kathleen C.: US EPA
Recipient: Nevarez, Mario: Anaquest, Inc.

Document Number: FIB-001-2372 To 2373 Date: 12/20/90

Title: (Letter requesting assistance in identifying ARARs)

Type: CORRESPONDENCE
Condition: DRAFT
Author: Caspe, Richard L.: US EPA
Recipient: Rohena-Betancourt, Santos: PR Environmental Quality Board

---

Document Number: FIB-001-0034 To 0034 Date: 08/20/85

Title: (Letter forwarding the Sampling Trip Report, Inorganic Laboratory Data, Organic Laboratory Data, and Work/Sampling Plan for the Fibers Public Supply Well Field site, Guayama)

Type: CORRESPONDENCE
Author: Clarke, Arthur J.: NUS Corporation
Recipient: Messina, Diane: US EPA
Attached: FIB-001-0035 FIB-001-0036 FIB-001-0037

Document Number: FIB-001-2376 To 2383 Date: 06/18/91

Title: (Letter forwarding attached comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Claudio, Eduardo Sanchez: Estado Libre Asociado de Puerto Rico
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-0276 To 0276 Date: 04/07/86

Title: (Letter forwarding Site Operations Plan and Remedial Investigation/Feasibility Study for Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: none: US EPA
Attached: FIB-001-0277

Document Number: FIB-001-0429 To 0595 Date: 06/05/90

Title: (Letter forwarding attached results of sampling from 2/90 and 4/90 at the Fibers Public Supply Wells site)

Type: DATA
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-001-1266 To 1266 Date: 09/20/85

Title: (Letter forwarding the revised Work Plan - Remedial Investigation/Feasibility Study for the Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: various: various
Attached: FIB-001-1267

Document Number: FIB-001-2307 To 2312 Date: 05/10/89

Title: (Letter pertaining to the Proposed Sampling Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-001-2317 To 2340 Date: 06/02/87

Title: (Letter in response to a May 27, 1987, meeting discussing the five monitor wells described in the Site Operations Plan)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Czapor, John V.: US EPA

Document Number: FIB-002-0389 To 0407 Date: 12/27/85

Title: Administrative Order Index No. II-CERCLA-50301. In the matter Fibers Public Supply Wells Site - Phillips Petroleum Company, Chevron Chemical Company - Respondents

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: various: various PRPs

Document Number: FIB-002-0423 To 0498 Date: 09/30/86

Title: Administrative Order on Consent Index No. II - RCRA-3013-60301

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: Bly, Herbert A.: American Home Products Corporation

---

Document Number: FIB-001-2374 To 2375 Date: 06/21/91

Title: (Letter consenting to a preliminary endorsement of discharging treated well water into the Puerto Rico Electric Power Authority's Patillas Irrigation Channel, as long as certain conditions are met)

Type: CORRESPONDENCE
Author: DelValle, Jose A.: Puerto Rico Electric Power Authority
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-1117 To 1117 Date: 01/30/90

Title: (Letter forwarding the rewritten Work Plan to conduct Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant)

Type: CORRESPONDENCE
Author: Kelly, William P.: American Home Products Corporation
Recipient: Miles, Joan: US EPA
Attached: FIB-001-1118

Document Number: FIB-002-0499 To 0501 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Culligan, John W.: American Home Products Corporation

---

Document Number: FIB-002-0502 To 0504 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Douce, William C.: Phillips Building

Document Number: FIB-002-0512 To 0519 Date: 03/08/85

Title: (104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: none: American Home Products Corporation

Document Number: FIB-002-0408 To 0422 Date: 09/28/89

Title: Administrative Order on Consent Index No. II - CERCLA-90303 (Fibers Public Supply Wells site)

Type: LEGAL DOCUMENT
Author: Muszynski, William J.: US EPA
Recipient: Kapp, Roger W.: American Home Products Corporation

Document Number: FIB-001-0075 To 0079 Date: / /

Title: NUS Corporation Project Work Plan, Guayama Well Field

Type: CORRESPONDENCE
Author: Neal, Bill: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-002-0546 To 0567 Date: 03/21/91

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Nevarez, Mario: Anaquest, Inc.
Recipient: Bosque, Adalberto: US EPA

Document Number: FIB-001-2341 To 2371 Date: 01/30/91

Title: (Letter discussing the ARAR determinations for Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: none
Recipient: Caspe, Richard L.: US EPA

Document Number: FIB-001-2388 To 2389 Date: 05/20/91

Title: (Letter commenting on the Interim Feasibility Study Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: Environmental Quality Board PR
Recipient: Hauptman, Melvin: US EPA

Document Number: FIB-001-2384 To 2385 Date: 05/30/91

Title: (Letter containing comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Rohena-Betancourt, Santos: PR Dept of Natural Resources
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-0055 To 0074 Date: 04/25/83

Title: Evaluation of Analytical Chemical Data from Guayama Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: Rosenberg, Michael: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-002-0001 To 0001 Date: 09/26/90

Title: (Letter forwarding the Draft Final Endangerment Assessment Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Alvi, M. Shaheer: US EPA
Attached: FIB-002-0002

Document Number: FIB-002-0527 To 0528 Date: 01/13/89

Title: (Letter forwarding the final revised Community Relations Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Johnson, Lillian: US EPA
Attached: FIB-002-0529

Document Number: FIB-001-0182 To 0275 Parent: FIB-001-0181 Date: 11/12/86

Title: Analytical Assessment of Excavated Soils. Quality Assurance Project Plan Short Form (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: PLAN
Author: Sherlock, Philip: Dames & Moore
Recipient: none: US EPA

Document Number: FIB-001-0035 To 0035 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding results of analysis of the duplicate matrix spike results)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0036 To 0036 Parent: FIB-001-0034 Date: 03/03/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0037 To 0054 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-2386 To 2387 Date: 05/29/91

Title: (Letter containing comments on the Feasibility Study)

Type: CORRESPONDENCE
Author: Torres, Arturo: US Dept of the Interior
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-0001 To 0033 Date: / /

Title: Preliminary Simulation of Groundwater Flow in the Alluvial Aquifer of Jobos Area, Guayama, Puerto Rico

Type: PLAN
Condition: DRAFT
Author: Torres-Gonzalez, Sigfredo: US Geological Survey (USGS)
Recipient: none: none

Document Number: FIB-002-0520 To 0526 Date: 11/13/89

Title: Addendum to Preliminary Health Assessment for Fibers Public Supply Wells, Guayama, Puerto Rico. CERCLIS No. 02PRD980763783

Type: PLAN
Author: various: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: none: none

Document Number: FIB-002-0002 To 0388 Parent: FIB-002-0001 Date: 09/01/90

Title: Draft Final Endangerment Assessment, Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: Wroblewski, Debra: Ebasco Services
Recipient: none: none

Document Number: FIB-002-0529 To 0545 Parent: FIB-002-0527 Date: 01/01/89

Title: Final Revised Community Relations Plan for the Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: PLAN
Author: Zanzalari, Gerry: Ebasco Services
Recipient: none: none

Document Number: FIB-001-0001 To 0033 Date: / /

Title: Preliminary Simulation of Groundwater Flow in the Alluvial Aquifer of Jobos Area, Guayama, Puerto Rico

Type: PLAN
Condition: DRAFT
Author: Torres-Gonzalez, Sigfredo: US Geological Survey (USGS)
Recipient: none: none

Document Number: FIB-001-0075 To 0079 Date: / /

Title: NUS Corporation Project Work Plan, Guayama Well Field

Type: CORRESPONDENCE
Author: Neal, Bill: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-001-0035 To 0035 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding results of analysis of the duplicate matrix spike results)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0037 To 0054 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0036 To 0036 Parent: FIB-001-0034 Date: 03/03/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0055 To 0074 Date: 04/25/83

Title: Evaluation of Analytical Chemical Data from Guayama Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: Rosenberg, Michael: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-002-0512 To 0519 Date: 03/08/85

Title: (104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: none: American Home Products Corporation

Document Number: FIB-002-0505 To 0511 Date: 04/19/85

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Alivernini, John M.: Ayerst-Wyeth Pharmaceuticals, Inc.
Recipient: Diamond, Lawrence W.: US EPA

Document Number: FIB-002-0499 To 0501 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Culligan, John W.: American Home Products Corporation

---

Document Number: FIB-002-0502 To 0504 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Douce, William C.: Phillips Building

Document Number: FIB-001-0034 To 0034 Date: 08/20/85

Title: (Letter forwarding the Sampling Trip Report, Inorganic Laboratory Data, Organic Laboratory Data, and Work/Sampling Plan for the Fibers Public Supply Well Field site, Guayama)

Type: CORRESPONDENCE
Author: Clarke, Arthur J.: NUS Corporation
Recipient: Messina, Diane: US EPA
Attached: FIB-001-0035 FIB-001-0036 FIB-001-0037

Document Number: FIB-001-1266 To 1266 Date: 09/20/85

Title: (Letter forwarding the revised Work Plan - Remedial Investigation/Feasibility Study for the Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: various: various
Attached: FIB-001-1267

Document Number: FIB-001-1267 To 1314 Parent: FIB-001-1266 Date: 10/01/85

Title: Work Plan Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field. Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-002-0389 To 0407 Date: 12/27/85

Title: Administrative Order Index No. II-CERCLA-50301. In the matter Fibers Public Supply Wells Site - Phillips Petroleum Company, Chevron Chemical Company - Respondents

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: various: various PRPs

Document Number: FIB-001-0277 To 0428 Parent: FIB-001-0276 Date: 04/01/86

Title: Site Operations Plan. Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0276 To 0276 Date: 04/07/86

Title: (Letter forwarding Site Operations Plan and Remedial Investigation/Feasibility Study for Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: none: US EPA
Attached: FIB-001-0277

Document Number: FIB-002-0423 To 0498 Date: 09/30/86

Title: Administrative Order on Consent Index No. II - RCRA-3013-60301

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: Bly, Herbert A.: American Home Products Corporation

---

Document Number: FIB-001-0182 To 0275 Parent: FIB-001-0181 Date: 11/12/86

Title: Analytical Assessment of Excavated Soils. Quality Assurance Project Plan Short Form (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: PLAN
Author: Sherlock, Philip: Dames & Moore
Recipient: none: US EPA

Document Number: FIB-001-0181 To 0181 Date: 11/20/86

Title: (Letter forwarding the proposed Quality Assurance/Quality Control plan)

Type: CORRESPONDENCE
Author: Bly, Herbert A.: American Home Products Corporation
Recipient: none: US EPA
Attached: FIB-001-0182

Document Number: FIB-001-0080 To 0180 Date: 12/10/86

Title: Addendum to Site Operations Plan, Remedial Investigation/Feasibility Study, Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0596 To 1116 Date: 04/15/87

Title: Analytical Assessment of Excavated Soils Contamination Report (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: DATA
Author: none: Dames & Moore
Recipient: none: American Home Products Corporation

Document Number: FIB-001-2317 To 2340 Date: 06/02/87

Title: (Letter in response to a May 27, 1987, meeting discussing the five monitor wells described in the Site Operations Plan)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Czapor, John V.: US EPA

Document Number: FIB-002-0529 To 0545 Parent: FIB-002-0527 Date: 01/01/89

Title: Final Revised Community Relations Plan for the Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: PLAN
Author: Zanzalari, Gerry: Ebasco Services
Recipient: none: none

Document Number: FIB-002-0527 To 0528 Date: 01/13/89

Title: (Letter forwarding the final revised Community Relations Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Johnson, Lillian: US EPA
Attached: FIB-002-0529

Document Number: FIB-001-2307 To 2312 Date: 05/10/89

Title: (Letter pertaining to the Proposed Sampling Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-002-0408 To 0422 Date: 09/28/89

Title: Administrative Order on Consent Index No. II - CERCLA-90303 (Fibers Public Supply Wells site)

Type: LEGAL DOCUMENT
Author: Muszynski, William J.: US EPA
Recipient: Kapp, Roger W.: American Home Products Corporation

---

Document Number: FIB-001-1118 To 1265 Parent: FIB-001-1117 Date: 11/01/89

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Guayama, Puerto Rico

Type: PLAN
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-002-0520 To 0526 Date: 11/13/89

Title: Addendum to Preliminary Health Assessment for Fibers Public Supply Wells, Guayama, Puerto Rico. CERCLIS No. 02PRD980763783

Type: PLAN
Author: various: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: none: none

Document Number: FIB-001-1117 To 1117 Date: 01/30/90

Title: (Letter forwarding the rewritten Work Plan to conduct Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant)

Type: CORRESPONDENCE
Author: Kelly, William P.: American Home Products Corporation
Recipient: Miles, Joan: US EPA
Attached: FIB-001-1118

Document Number: FIB-001-0429 To 0595 Date: 06/05/90

Title: (Letter forwarding attached results of sampling from 2/90 and 4/90 at the Fibers Public Supply Wells site)

Type: DATA
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-002-0002 To 0388 Parent: FIB-002-0001 Date: 09/01/90

Title: Draft Final Endangerment Assessment, Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: Wroblewski, Debra: Ebasco Services
Recipient: none: none

Document Number: FIB-002-0001 To 0001 Date: 09/26/90

Title: (Letter forwarding the Draft Final Endangerment Assessment Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Alvi, M. Shaheer: US EPA
Attached: FIB-002-0002

Document Number: FIB-001-1716 To 1881 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume I. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1882 To 2306 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume II. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1315 To 1496 Date: 11/01/90

Title: Report for the Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume I - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1497 To 1715 Date: 11/01/90

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume II, Appendices - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-2372 To 2373 Date: 12/20/90

Title: (Letter requesting assistance in identifying ARARs)

Type: CORRESPONDENCE
Condition: DRAFT
Author: Caspe, Richard L.: US EPA
Recipient: Rohena-Betancourt, Santos: PR Environmental Quality Board

---

Document Number: FIB-001-2341 To 2371 Date: 01/30/91

Title: (Letter discussing the ARAR determinations for Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: none
Recipient: Caspe, Richard L.: US EPA

Document Number: FIB-002-0546 To 0567 Date: 03/21/91

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Nevarez, Mario: Anaquest, Inc.
Recipient: Bosque, Adalberto: US EPA

Document Number: FIB-002-0568 To 0997 Date: 04/01/91

Title: Interim Feasibility Study Report - Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Author: none: Leggette, Brashears & Graham
Recipient: none: various parties associated with the site

Document Number: FIB-002-0998 To 0999 Date: 04/18/91

Title: (Letter noticing Anaquest, Inc., that it may be a responsible party at the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Callahan, Kathleen C.: US EPA
Recipient: Nevarez, Mario: Anaquest, Inc.

Document Number: FIB-001-2388 To 2389 Date: 05/20/91

Title: (Letter commenting on the Interim Feasibility Study Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: Environmental Quality Board PR
Recipient: Hauptman, Melvin: US EPA

Document Number: FIB-001-2386 To 2387 Date: 05/29/91

Title: (Letter containing comments on the Feasibility Study)

Type: CORRESPONDENCE
Author: Torres, Arturo: US Dept of the Interior
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2384 To 2385 Date: 05/30/91

Title: (Letter containing comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Rohena-Betancourt, Santos: PR Dept of Natural Resources
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2376 To 2383 Date: 06/18/91

Title: (Letter forwarding attached comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Claudio, Eduardo Sanchez: Estado Libre Asociado de Puerto Rico
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2374 To 2375 Date: 06/21/91

Title: (Letter consenting to a preliminary endorsement of discharging treated well water into the Puerto Rico Electric Power Authority's Patillas Irrigation Channel, as long as certain conditions are met)

Type: CORRESPONDENCE
Author: DelValle, Jose A.: Puerto Rico Electric Power Authority
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-002-1000 To 1000 Date: 07/23/91

Title: (News Announcement: Notice of Public Meeting and Opportunity to Comment on the Proposed Plan for Fibers Public Supply Wells - in Spanish)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: El Nuevo Dia

Document Number: FIB-001-0001 To 0033 Date: / /

Title: Preliminary Simulation of Groundwater Flow in the Alluvial Aquifer of Jobos Area, Guayama, Puerto Rico

Type: PLAN
Condition: DRAFT
Author: Torres-Gonzalez, Sigfredo: US Geological Survey (USGS)
Recipient: none: none

Document Number: FIB-001-0034 To 0034 Date: 08/20/85

Title: (Letter forwarding the Sampling Trip Report, Inorganic Laboratory Data, Organic Laboratory Data, and Work/Sampling Plan for the Fibers Public Supply Well Field site, Guayama)

Type: CORRESPONDENCE
Author: Clarke, Arthur J.: NUS Corporation
Recipient: Messina, Diane: US EPA
Attached: FIB-001-0035 FIB-001-0036 FIB-001-0037

Document Number: FIB-001-0035 To 0035 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding results of analysis of the duplicate matrix spike results)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0036 To 0036 Parent: FIB-001-0034 Date: 03/03/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0037 To 0054 Parent: FIB-001-0034 Date: 02/28/83

Title: (Letter forwarding the results of analytical work)

Type: CORRESPONDENCE
Author: Siebert, Rebecca J.: Mead CompuChem Laboratory
Recipient: Thacker, Richard: US EPA

Document Number: FIB-001-0055 To 0074 Date: 04/25/83

Title: Evaluation of Analytical Chemical Data from Guayama Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: Rosenberg, Michael: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-001-0075 To 0079 Date: / /

Title: NUS Corporation Project Work Plan, Guayama Well Field

Type: CORRESPONDENCE
Author: Neal, Bill: NUS Corporation
Recipient: none: US EPA

Document Number: FIB-001-0080 To 0180 Date: 12/10/86

Title: Addendum to Site Operations Plan, Remedial Investigation/Feasibility Study, Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0181 To 0181 Date: 11/20/86

Title: (Letter forwarding the proposed Quality Assurance/Quality Control plan)

Type: CORRESPONDENCE
Author: Bly, Herbert A.: American Home Products Corporation
Recipient: none: US EPA
Attached: FIB-001-0182

Document Number: FIB-001-0182 To 0275 Parent: FIB-001-0181 Date: 11/12/86

Title: Analytical Assessment of Excavated Soils. Quality Assurance Project Plan Short Form (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: PLAN
Author: Sherlock, Philip: Dames & Moore
Recipient: none: US EPA

Document Number: FIB-001-0276 To 0276 Date: 04/07/86

Title: (Letter forwarding Site Operations Plan and Remedial Investigation/Feasibility Study for Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: none: US EPA
Attached: FIB-001-0277

Document Number: FIB-001-0277 To 0428 Parent: FIB-001-0276 Date: 04/01/86

Title: Site Operations Plan. Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field, Guayama, Puerto Rico

Type: CORRESPONDENCE
Author: none: Leggette, Brashears & Graham
Recipient: none: US EPA

Document Number: FIB-001-0429 To 0595 Date: 06/05/90

Title: (Letter forwarding attached results of sampling from 2/90 and 4/90 at the Fibers Public Supply Wells site)

Type: DATA
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-001-0596 To 1116 Date: 04/15/87

Title: Analytical Assessment of Excavated Soils Contamination Report (Fibers Public Supply Wells site, Guayama, Puerto Rico)

Type: DATA
Author: none: Dames & Moore
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1117 To 1117 Date: 01/30/90

Title: (Letter forwarding the rewritten Work Plan to conduct Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant)

Type: CORRESPONDENCE
Author: Kelly, William P.: American Home Products Corporation
Recipient: Miles, Joan: US EPA
Attached: FIB-001-1118

Document Number: FIB-001-1118 To 1265 Parent: FIB-001-1117 Date: 11/01/89

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Guayama, Puerto Rico

Type: PLAN
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1266 To 1266 Date: 09/20/85

Title: (Letter forwarding the revised Work Plan - Remedial Investigation/Feasibility Study for the Fibers Public Supply Well Field, Guayama, Puerto Rico)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: various: various
Attached: FIB-001-1267

Document Number: FIB-001-1267 To 1314 Parent: FIB-001-1266 Date: 10/01/85

Title: Work Plan Remedial Investigation/Feasibility Study. Fibers Public Supply Well Field. Guayama, Puerto Rico

Type: PLAN
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1315 To 1496 Date: 11/01/90

Title: Report for the Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume I - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1497 To 1715 Date: 11/01/90

Title: Modified Remedial Investigation for a Soils Disposal Area at the Ayerst-Wyeth Pharmaceuticals, Inc., Plant, Volume II, Appendices - Draft Final

Type: REPORT
Condition: DRAFT
Author: none: Engineering-Science, Inc.
Recipient: none: American Home Products Corporation

Document Number: FIB-001-1716 To 1881 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume I. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-1882 To 2306 Date: 10/01/90

Title: Draft Final Remedial Investigation Report, Volume II. Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: none: Leggette, Brashears & Graham
Recipient: none: none

Document Number: FIB-001-2307 To 2312 Date: 05/10/89

Title: (Letter pertaining to the Proposed Sampling Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Peterson, Carole: US EPA

Document Number: FIB-001-2317 To 2340 Date: 06/02/87

Title: (Letter in response to a May 27, 1987, meeting discussing the five monitor wells described in the Site Operations Plan)

Type: CORRESPONDENCE
Author: Crum, Frank H.: Leggette, Brashears & Graham
Recipient: Czapor, John V.: US EPA

Document Number: FIB-001-2341 To 2371 Date: 01/30/91

Title: (Letter discussing the ARAR determinations for Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: none
Recipient: Caspe, Richard L.: US EPA

Document Number: FIB-001-2372 To 2373 Date: 12/20/90

Title: (Letter requesting assistance in identifying ARARs)

Type: CORRESPONDENCE
Condition: DRAFT
Author: Caspe, Richard L.: US EPA
Recipient: Rohena-Betancourt, Santos: PR Environmental Quality Board

---

Document Number: FIB-001-2374 To 2375 Date: 06/21/91

Title: (Letter consenting to a preliminary endorsement of discharging treated well water into the Puerto Rico Electric Power Authority's Patillas Irrigation Channel, as long as certain conditions are met)

Type: CORRESPONDENCE
Author: DelValle, Jose A.: Puerto Rico Electric Power Authority
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2376 To 2383 Date: 06/18/91

Title: (Letter forwarding attached comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Claudio, Eduardo Sanchez: Estado Libre Asociado de Puerto Rico
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2384 To 2385 Date: 05/30/91

Title: (Letter containing comments on the Fibers Public Supply Wells Feasibility Study - in Spanish)

Type: CORRESPONDENCE
Author: Rohena-Betancourt, Santos: PR Dept of Natural Resources
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2386 To 2387 Date: 05/29/91

Title: (Letter containing comments on the Feasibility Study)

Type: CORRESPONDENCE
Author: Torres, Arturo: US Dept of the Interior
Recipient: Gelabert, Pedro A.: US EPA

Document Number: FIB-001-2388 To 2389 Date: 05/20/91

Title: (Letter commenting on the Interim Feasibility Study Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Ojeda, Pedro A. Maldonado: Environmental Quality Board PR
Recipient: Hauptman, Melvin: US EPA

Document Number: FIB-002-0001 To 0001 Date: 09/26/90

Title: (Letter forwarding the Draft Final Endangerment Assessment Report for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Alvi, M. Shaheer: US EPA
Attached: FIB-002-0002

Document Number: FIB-002-0002 To 0388 Parent: FIB-002-0001 Date: 09/01/90

Title: Draft Final Endangerment Assessment, Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Condition: DRAFT
Author: Wroblewski, Debra: Ebasco Services
Recipient: none: none

Document Number: FIB-002-0389 To 0407 Date: 12/27/85

Title: Administrative Order Index No. II-CERCLA-50301. In the matter Fibers Public Supply Wells Site - Phillips Petroleum Company, Chevron Chemical Company - Respondents

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: various: various PRPs

Document Number: FIB-002-0408 To 0422 Date: 09/28/89

Title: Administrative Order on Consent Index No. II - CERCLA-90303 (Fibers Public Supply Wells site)

Type: LEGAL DOCUMENT
Author: Muszynski, William J.: US EPA
Recipient: Kapp, Roger W.: American Home Products Corporation

---

Document Number: FIB-002-0423 To 0498 Date: 09/30/86

Title: Administrative Order on Consent Index No. II - RCRA-3013-60301

Type: LEGAL DOCUMENT
Author: Daggett, Christopher J.: US EPA
Recipient: Bly, Herbert A.: American Home Products Corporation

---

Document Number: FIB-002-0499 To 0501 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Culligan, John W.: American Home Products Corporation

---

Document Number: FIB-002-0502 To 0504 Date: 07/29/85

Title: (107(a) Notice Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: Douce, William C.: Phillips Building

Document Number: FIB-002-0505 To 0511 Date: 04/19/85

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Alivernini, John M.: Ayerst-Wyeth Pharmaceuticals, Inc.
Recipient: Diamond, Lawrence W.: US EPA

Document Number: FIB-002-0512 To 0519 Date: 03/08/85

Title: (104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Librizzi, William J.: US EPA
Recipient: none: American Home Products Corporation

Document Number: FIB-002-0520 To 0526 Date: 11/13/89

Title: Addendum to Preliminary Health Assessment for Fibers Public Supply Wells, Guayama, Puerto Rico. CERCLIS No. 02PRD980763783

Type: PLAN
Author: various: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: none: none

Document Number: FIB-002-0527 To 0528 Date: 01/13/89

Title: (Letter forwarding the final revised Community Relations Plan for the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Sachdev, Dev R.: Ebasco Services
Recipient: Johnson, Lillian: US EPA
Attached: FIB-002-0529

Document Number: FIB-002-0529 To 0545 Parent: FIB-002-0527 Date: 01/01/89

Title: Final Revised Community Relations Plan for the Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: PLAN
Author: Zanzalari, Gerry: Ebasco Services
Recipient: none: none

Document Number: FIB-002-0546 To 0567 Date: 03/21/91

Title: (Response to 104(e) Information Request Letter)

Type: CORRESPONDENCE
Author: Nevarez, Mario: Anaquest, Inc.
Recipient: Bosque, Adalberto: US EPA

Document Number: FIB-002-0568 To 0997 Date: 04/01/91

Title: Interim Feasibility Study Report - Fibers Public Supply Wells Site, Guayama, Puerto Rico

Type: REPORT
Author: none: Leggette, Brashears & Graham
Recipient: none: various parties associated with the site

Document Number: FIB-002-0998 To 0999 Date: 04/18/91

Title: (Letter noticing Anaquest, Inc., that it may be a responsible party at the Fibers Public Supply Wells site)

Type: CORRESPONDENCE
Author: Callahan, Kathleen C.: US EPA
Recipient: Nevarez, Mario: Anaquest, Inc.

Document Number: FIB-002-1000 To 1000 Date: 07/23/91

Title: (News Announcement: Notice of Public Meeting and Opportunity to Comment on the Proposed Plan for Fibers Public Supply Wells - in Spanish)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: El Nuevo Dia
