

FILE

**PERMIT NO. HW-50343-000
ANNUAL REPORT**

**JANUARY 1 THROUGH
DECEMBER 31, 1996**

Terranext



6200 Rothway, Suite 190 Houston, TX 77040

January 24, 1997

Mr. Paul Lewis
Manager
Corrective Action (MC 127)
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087

**Re: Former Southern Pacific Transportation Company (SPTCo)
Union Pacific Railroad Company
4910 Liberty Road Facility, Houston
Post-Closure Care Permit No. HW-50343-000
Industrial Solid Waste Registration No. 31457
EPA ID No. TXD000820266
Compliance Plan No. CP-50343
Annual Report: January 1 through December 31, 1996**

Dear Mr. Lewis:

Terranext is pleased to provide the enclosed Annual Report for the above-referenced facility on behalf of Union Pacific Railroad Company (UP). This report presents a summary of activities conducted for the referenced facility performed as part of the post-closure care and is submitted in accordance with Provision III.B.1, IV.C.4.g, and V.F. of the Permit. The designated reporting period includes January 1 through December 31, 1996.

Further correspondence regarding this report or this project should be directed to: Mr. Ed Honig, Manager Environmental Site Remediation, Union Pacific Railroad Company; 1416 Dodge Street; Omaha, Nebraska; 68179. You may contact Mr. Honig via telephone at (402) 271-5979 if you have any questions.

Sincerely,

TERRANEXT

Curtis L. Jones
Senior Project Manager

Enclosure
Distribution: per Attachment

/u/proj/sp/2069/tmrcc12497.ltr

**HOUSTON WOOD PRESERVING WORKS
COMPLIANCE PLAN NO. CP-50343**

Distribution List

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Mr. Steve Omo, Permits Section (Letter) (MC130) Industrial & Hazardous Waste Division	
Ms. Cyndi Garrigan, Corrective Action (Letter) (MC127) Industrial & Hazardous Waste Division	

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**PERMIT NO. HW-50343-000
ANNUAL REPORT
JANUARY 1 THROUGH DECEMBER 31, 1996**

**Union Pacific Railroad Company
(Formerly Southern Pacific Transportation Company)
Wood Preserving Works
4910 Liberty Road
Houston, Texas**

Terranext Project No. 44102069/05

Prepared For:

**Union Pacific Railroad Company
(Formerly Southern Pacific Lines)
One Market Plaza
San Francisco, California 94105**

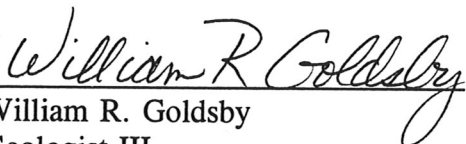
January 24, 1996

Terranext

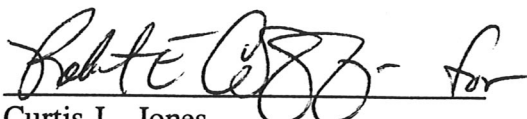
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ANNUAL REPORT
JANUARY 1 THROUGH DECEMBER 31, 1996

Union Pacific Railroad Company
(Formerly Southern Pacific Transportation Company)
Wood Preserving Works
4910 Liberty Road
Houston, Texas

Prepared By:


William R. Goldsby
Geologist III

Reviewed and Approved By:


Curtis L. Jones
Project Manager
Manager, Midwest Operations

Terranext

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1.0 INTRODUCTION

1.1 Purpose

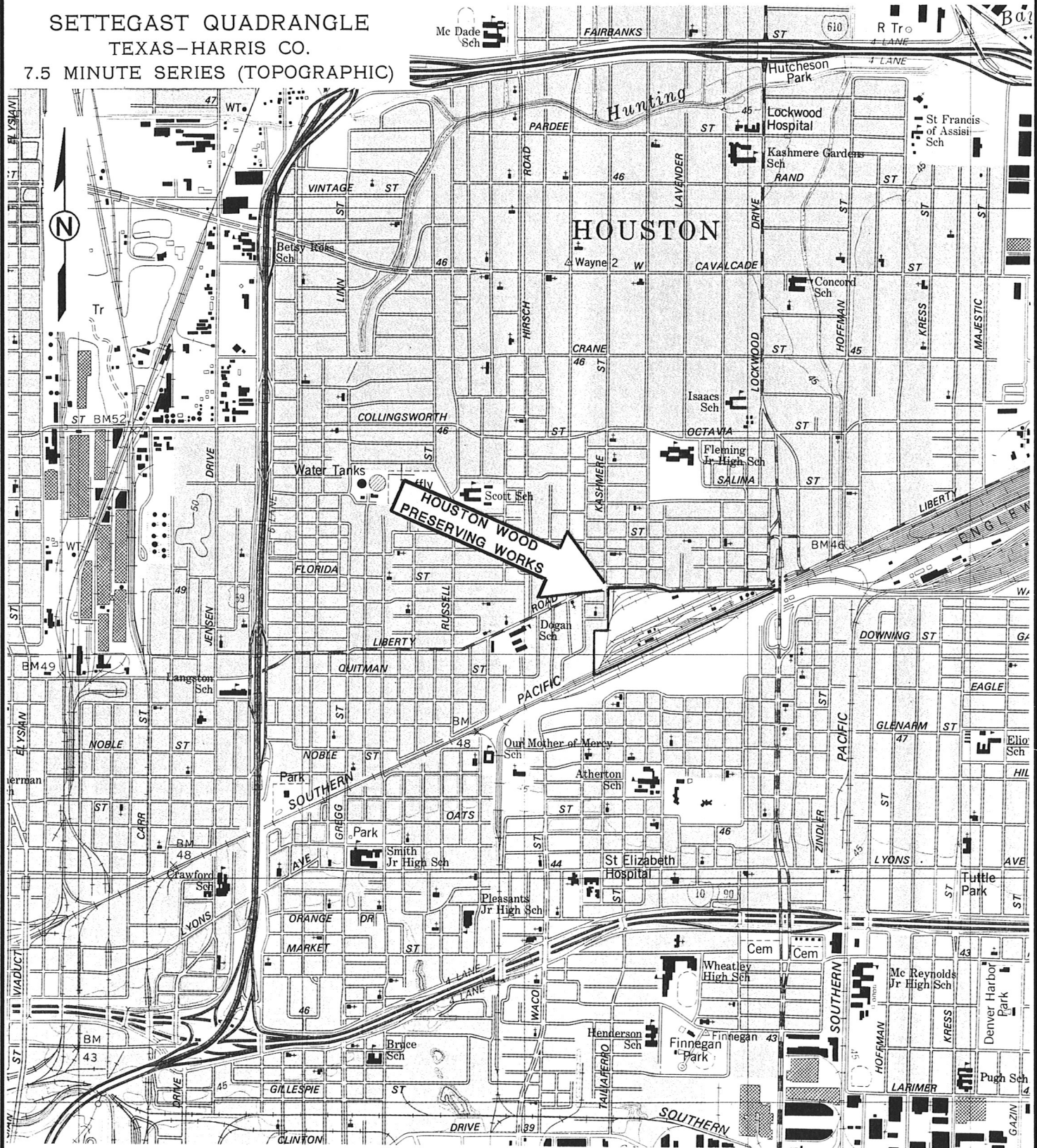
On June 20, 1994, the Texas Natural Resource Conservation Commission (TNRCC) issued Permit Number HW-50343-000 (hereinafter, Permit) and TNRCC Compliance Plan Number CP-50343, which is incorporated within the Permit. The Permit applies to post-closure care for one former surface impoundment (TNRCC Permit Unit No. II.B.1) located at the Union Pacific Railroad Company (UP - formerly Southern Pacific Transportation Company) former Houston Wood Preserving Works (HWPW), 4910 Liberty Road, Houston, Texas (Figure 1). The Permit requires a RCRA Facility Investigation (RFI), and the Compliance Plan requires an Extent of Contamination (EOC) Investigation; the EOC Work Plan dated September 16, 1994, and the RFI Work Plan dated October 14, 1994, were approved respectively by letters from the TNRCC dated September 29 and October 16, 1995. Field investigation activities (Phase 1) outlined in the EOC and RFI Work Plans were initiated in October 1995. This Annual Report (AR) for 1996 was prepared by Terranext on behalf of UP to comply with the requirements of Provisions III.B.1, IV.C.4.g, and V.F of the Permit.

1.2 Applicability and Scope

Provision III.B.1 of the Permit requires that this AR include the following:

- a. Information and records required by Title 30 Texas Administrative Code (TAC) Section 335.154, including:
 1. U.S. Environmental Protection Agency (EPA) identification number, name, and address of the facility;
 2. Calendar year covered by the report;

SETTEGAST QUADRANGLE
TEXAS-HARRIS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



PROJ.# 44102069

PAGE#

SCALE: 1" = 2000'

DRAWN BY: AP

FILE NO. FIG1-1

DESIGNED BY:

DATE: 3/26/96

APPROVED BY: WRG

Terranext

FIGURE 1
SITE VICINITY MAP
SPTCo WOOD PRESERVING WORKS
4910 LIBERTY ROAD
HOUSTON, TEXAS

3. TWC (Texas Water Commission, predecessor agency to the TNRCC) hazardous waste code and quantity of each hazardous waste received by the facility during the year;
 4. Method of storage, processing, or disposal of each hazardous waste;
 5. Most recent closure cost estimate under the regulations contained in 40 Code of Federal Regulations (CFR) Section 264.142 and 30 TAC Section 1335.178, and for disposal facilities, the most recent post-closure cost estimate under 40 CFR 264.144 (see Item d below);
 6. For generators who treat, store, or dispose of hazardous waste on-site, a description of efforts undertaken to reduce the volume and toxicity of waste generated;
 7. For generators who treat, store, or dispose of hazardous waste on-site, a description of changes in volume and toxicity of waste actually achieved in comparison with previous years;
 8. Certification signed by owner or operator of the facility or authorized representative (see Item e below);
- b. Summary of ground water compliance monitoring activities;
 - c. Summary of inspections made and any remedial activities conducted;
 - d. Summary of annual cost estimate adjustments for facility closure and post-closure care;
 - e. Certification of waste minimization in accordance with Permit Provision V.N, as follows:

1. Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes generated by the facility operation to the degree determined to be economically practicable;
2. The proposed method of treatment, storage, or disposal is that practicable method currently available to the permittee which minimizes the present and future threat to human health and the environment.

As provided in Provision II.B, the Permit authorizes and requires the permittee to perform post-closure care for a landfill, closed, consisting of one former surface impoundment, Notice of Registration (NOR) Facility No. 01, total surface area of 0.5923 acre, total capacity of 5,065 cubic yards. Since this facility is closed, hazardous and toxic waste is not received or disposed of at the facility. Wastes are being generated as Investigation Derived Wastes (IDW) associated with the ongoing, periodic monitoring of Point of Compliance (POC) and Corrective Action Observation (CAO) wells, interim remedial activities, and implementation of Work Plans approved under the Permit and Compliance Plan. A recovery system has not been installed for this facility. Therefore, Items a through e, as listed above, are addressed herein as they relate to a facility under post-closure care.

The AR items as listed above are addressed in text summary in Section 2.0, with supporting figures and tables presented at the end of each major section. Reference information is presented in the appendices.

The definitions of the Uppermost Transmissive Zone (UTZ) and Secondary Transmissive Zone (STZ) as used in this AR are consistent with CP Provision I.A:

- * UTZ refers to the first sand unit encountered at 35 feet above mean sea level (MSL), averaging 6 to 8 feet in thickness.

- * STZ refers to the second sand unit encountered at approximately 15 feet MSL, averaging 8 to 10 feet in thickness.

2.0 REPORT ITEMS

2.1 Information and Records Required by 30 TAC 335.154

2.1.1 Facility Identification

This facility is identified by the following information:

EPA identification number:	TXD000820266
Facility name:	Surface Impoundment
Address:	Former Houston Wood Preserving Works Union Pacific Railroad Company (Formerly Southern Pacific Transportation Company) 4910 Liberty Road Houston, Texas 77020

2.1.2 Calendar Year Covered by This Report

The activity period covered by this report is designated in Provision III.B.1 of the Permit and encompasses January 1 through December 31, 1996.

2.1.3 Hazardous Wastes Codes and Quantities Received

This facility is closed and has not received any hazardous wastes. A revised Notice of Registration (NOR) for solid wastes generated at 4910 Liberty Road was submitted to the TNRCC under cover letter dated August 8, 1995. The revised NOR includes notice of a temporary container storage area (i.e., less than 90 or 180 days, depending on volume of waste generated) around the permitted and clean-closed surface impoundment (Permit

Unit II.B.1) for the storage of waste ground water generated by purging and sampling of monitor wells and waste soil generated by soil boring/monitor well installation.

The revised NOR included hazardous aqueous wastes generated from equipment decontamination and purging of monitor wells for site investigation activities. Remediation wastes include soils contaminated with creosote sludge or constituents. Nonhazardous wastes such as scrap metals, personal protective equipment, waste oil, and waste rail ties were also included in the NOR. The scrap metals, waste oil, and rail ties are wastes generated from operations at the rail yard and are not related to activities conducted under the Permit.

2.1.4 Storage, Processing, or Disposal of Hazardous Waste

No wastes have been processed at this facility. Only waste oils from facility operations and IDW wastes from monitoring or remedial action associated with conduct under the provisions of the Permit and Compliance Plan were generated during the reporting period. Waste ground water has been temporarily stored in accord with 30 TAC 335.69(d); these purge waters were contained in 55-gallon drums, labeled as to the contents of the drum and the source (i.e., monitor well), during the January 1996, and September 1996 semi-annual sampling events. Temporarily stored purge waters were vacuum-pumped from the drums for off-site disposal. The schedule for ground water monitoring converted to semi-annual from quarterly beginning in July 1995.

The IDW were properly disposed off-site; a copy of the Annual Waste Summary Form (submitted separately) for reporting year 1996 is presented in Appendix A.

2.1.5 Post-Closure Care Cost Estimate

The regulated unit was clean-closed in 1984. A revised post-closure care cost estimate is addressed in Section 2.4 of this AR.

2.1.6 Reduction of Volume and Toxicity of Waste Generated

Waste minimization typically applies to operating facilities; as stated above, this facility has been closed since 1984. However, wastes are generated at this facility as a result of the specific investigation or post-closure care activities directed by the TNRCC under the Permit and Compliance Plan. These IDW and remediation waste volumes will be directly related to the scope and schedule of activities as they are conducted under the RCRA Facility Investigation (RFI) and Extent of Contamination (EOC) Work Plans, as approved by the TNRCC under the Permit and Compliance Plan.

2.1.7 Waste Minimization Relative to Previous Years

As stated in Section 2.1.6, IDW are directly controlled by the activities required by the Permit and Compliance Plan. These wastes are not directly comparable with respect to years prior to 1984 when this facility was operating.

2.1.8 Certification

Certification is addressed in Section 2.5 of this AR.

2.2 Summary of Ground Water Compliance Monitoring Activities

Existing CAO wells and POC wells (Figure 2) were monitored and sampled on a semi-annual basis in January and September 1996 to evaluate the extent of ground water contamination in the UTZ and STZ. The schedule for ground water monitoring was changed from quarterly to semi-annual beginning in July 1995, as provided by Provision VI.C.3 of the Compliance Plan. Ground water monitoring results, including analytical laboratory reports, were presented in the first semi-annual report, dated March 22, 1996. Ten wells (MW-1a, -2, -3, -4, -5, -7, -8, -9, -10a, and -11a) completed in the UTZ and two wells (MW-10b and -11b) and three piezometers (P-10, -11, and -12) completed in the STZ were sampled during each event in 1996.

The ground water analytical data for each semi-annual sampling event are listed in Tables 1 through 4; results are tabulated separately for the UTZ and STZ. For each sampling event, detected concentrations of analytes in excess of the Ground Water Protection Standard are indicated by shading on these tables. The presence of non-aqueous phase liquids (NAPLs), both light and dense phases, was not noted within any of the monitor wells or piezometers during either of the semi-annual monitoring events.

For each monitor well and piezometer, Table 5 lists the total depth, casing reference elevation, the measured depth to water, and the calculated water level elevation relative to mean sea level. For both water-bearing zones, but particularly in the STZ, the limited number of monitor wells and piezometers provides a general indication that the potentiometric (UTZ) and piezometric (STZ) surfaces have very low gradients. The actual directions of flow and gradients of the potentiometric and piezometric surfaces will be confirmed with additional site investigation being conducted under the EOC and RFI Work Plans.

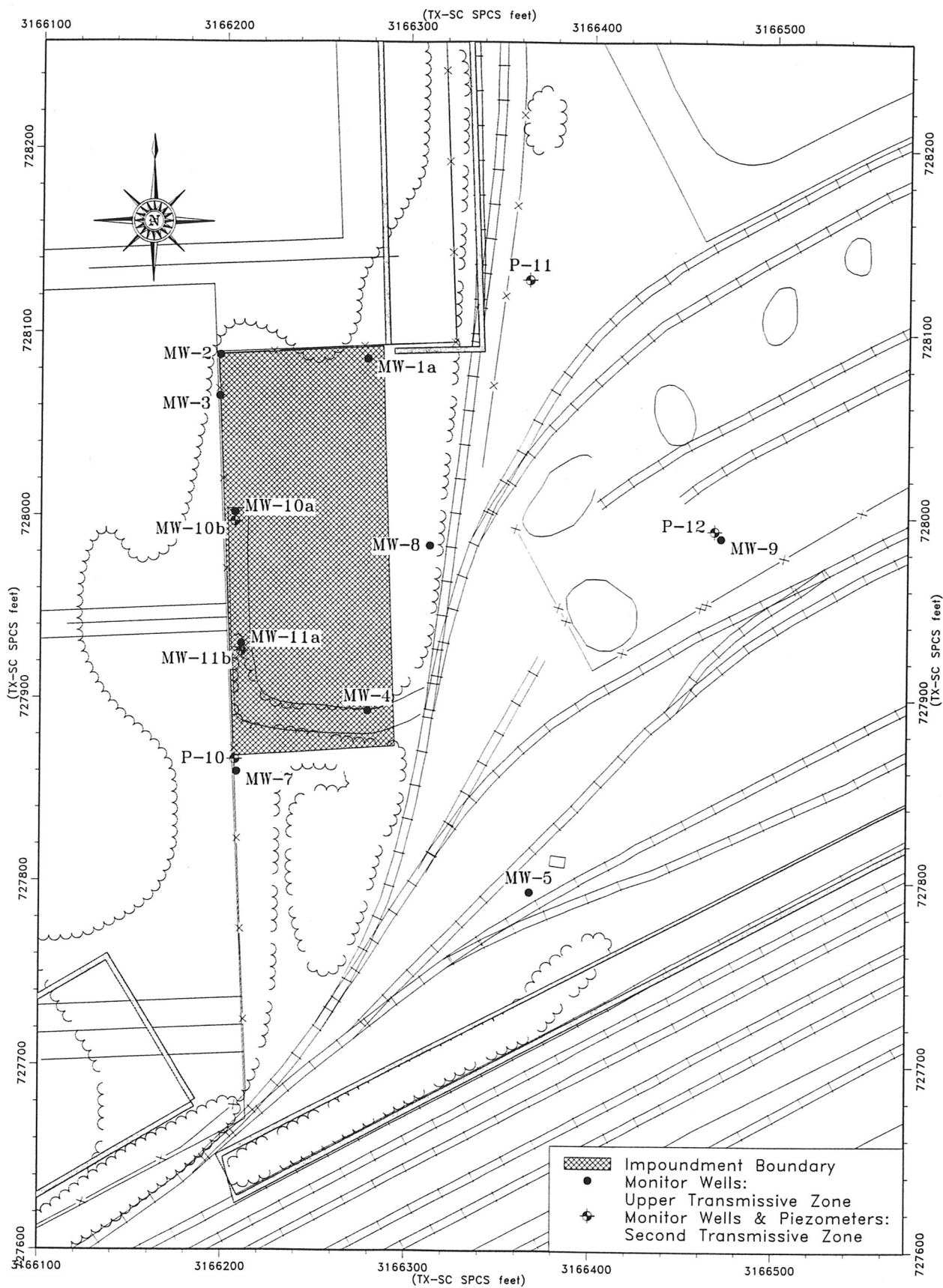


Figure 2. Monitoring Wells and Piezometers

Compliance Plan Provision VI.D provides two options for data evaluation, including direct comparison with the concentration limits for the Ground Water Protection Standard (Appendix B) or statistical analysis of the data. Table 6 lists the results of direct comparison of the analytical data for the semi-annual sampling events with the Ground Water Protection Standard and specifications of Compliance Plan Provision VI.D.1. Wells and piezometers are considered compliant with the Ground Water Protection Standard if all constituents of concern were detected at concentrations less than or equal to the respective concentration limit. Wells and piezometers are considered noncompliant if one or more constituents of concern were detected at a concentration greater than the respective concentration limit. In general, naphthalene, acenaphthene, and total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations suggest isolated areas of concentration in both the UTZ and STZ for the semi-annual sampling events.

The concentrations of naphthalene, acenaphthene, and total BTEX for each sampling period for the UTZ are plotted on Figures 3, 4, and 5; and for the STZ on Figures 6, 7, and 8. Review of these figures demonstrates that the concentrations of the selected analytes have exceeded the TNRCC concentrations limits in select wells since monitoring was initiated in 1985. It is also apparent that the concentrations have generally been decreasing over time. The exception being the most recent semi-annual sampling event.



Naphthalene

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

Terranext

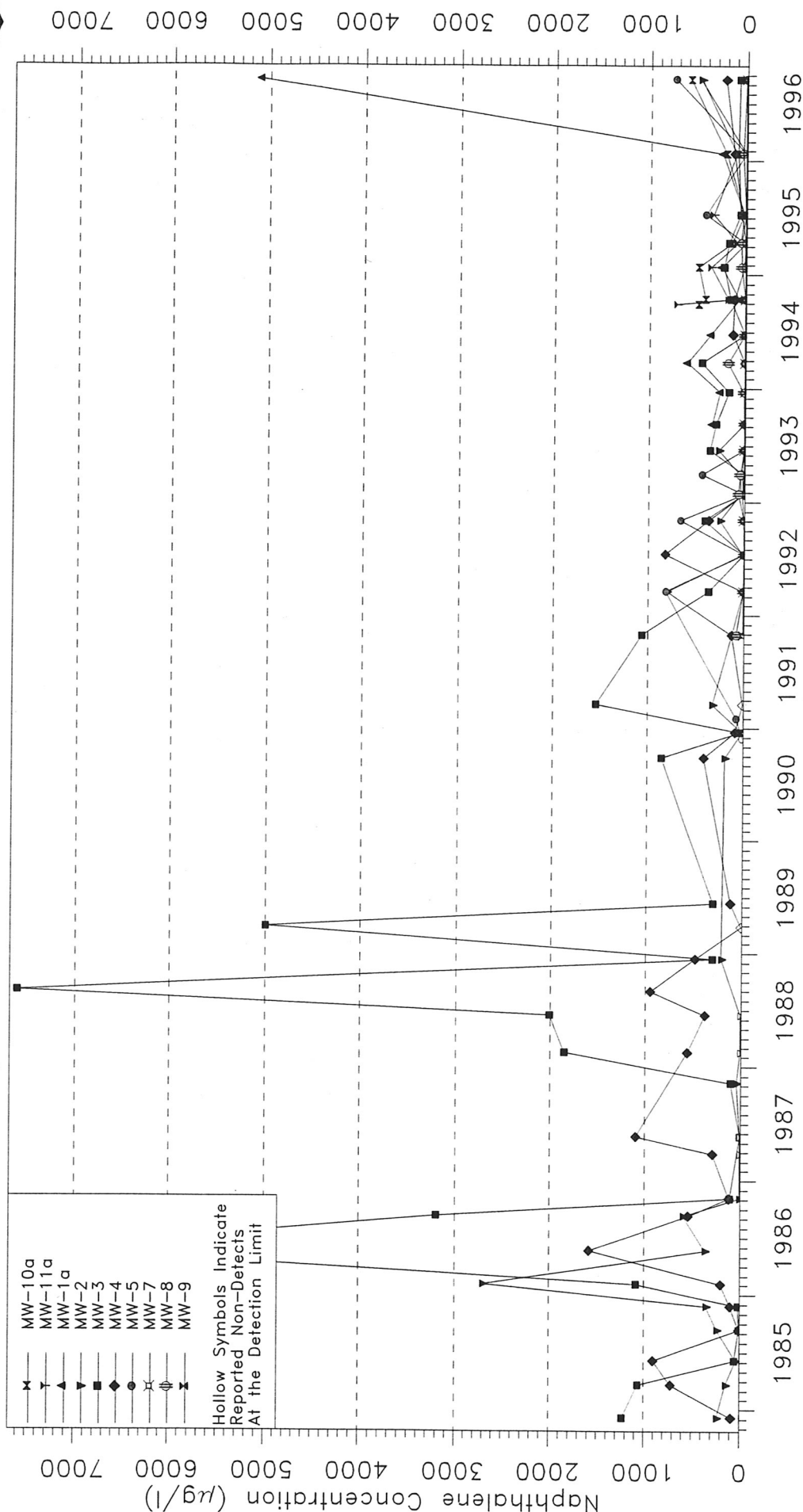


Figure 3: Concentration of Naphthalene Versus Time for UTZ WELLS

Acenaphthene

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

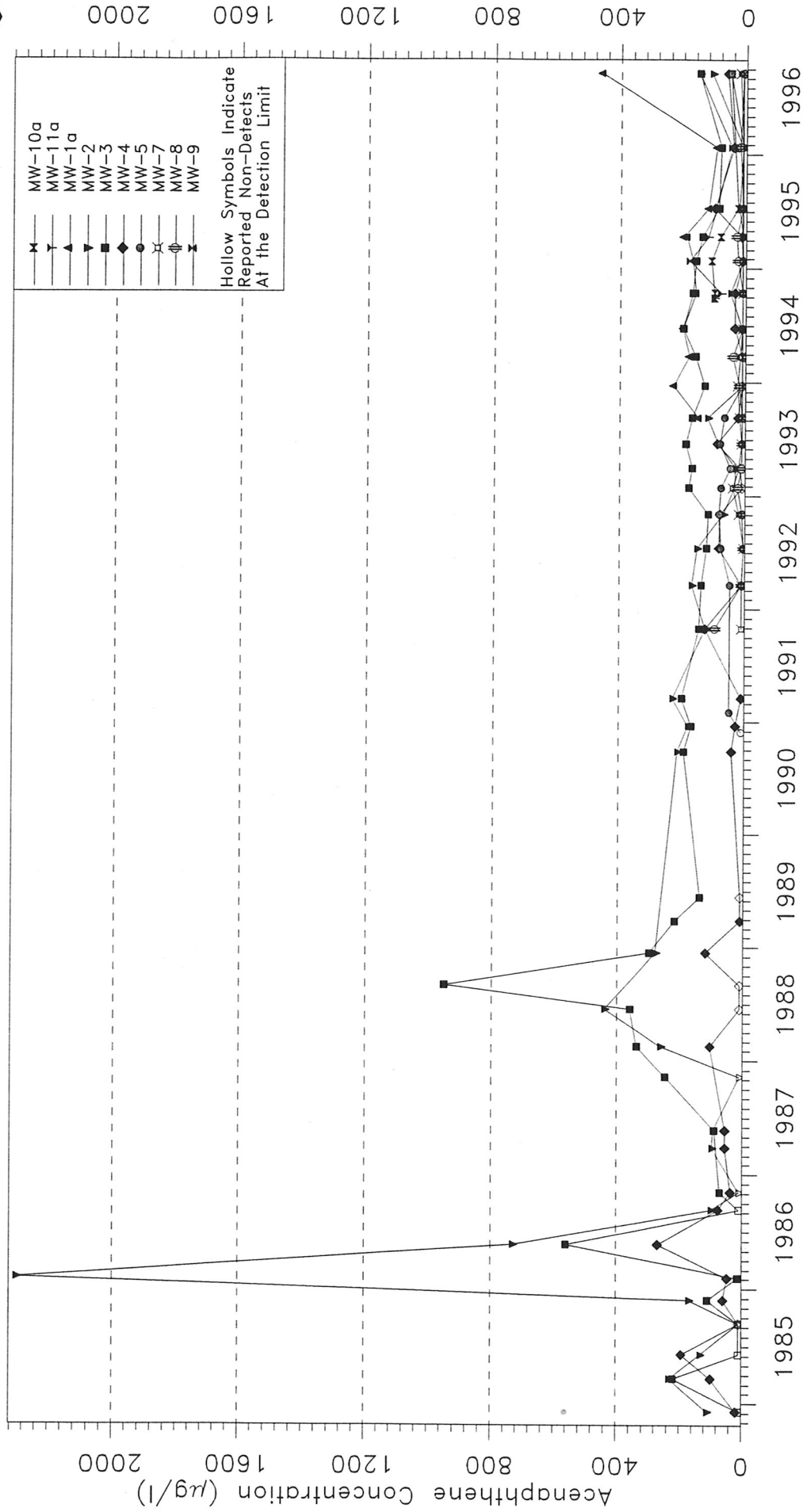


Figure 4: Concentration of Acenaphthene Versus Time for UTZ WELLS



Total BTEX

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

Terranext

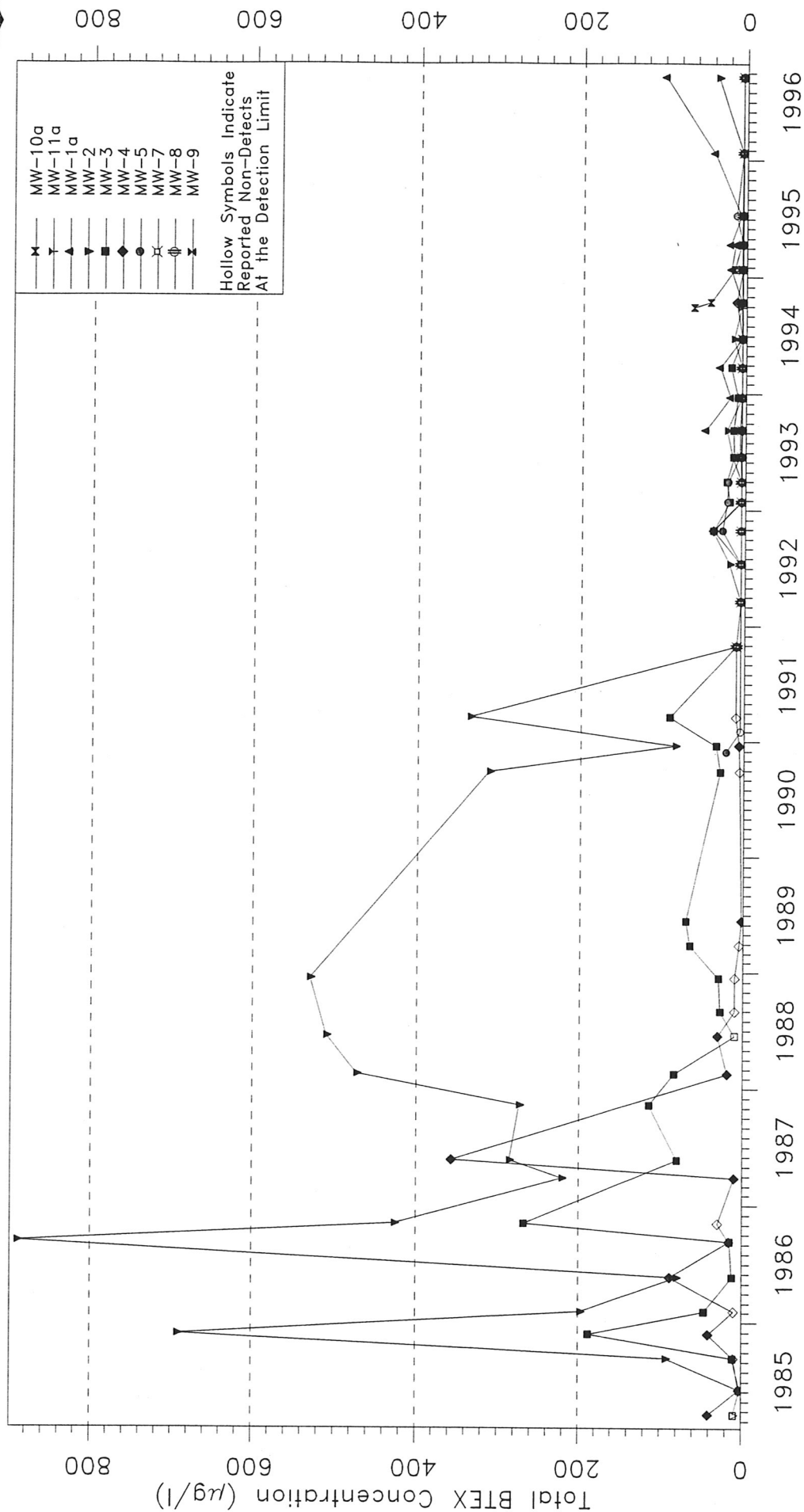


Figure 5: Concentration of Total BTEX Versus Time for UTZ WELLS

Naphthalene

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

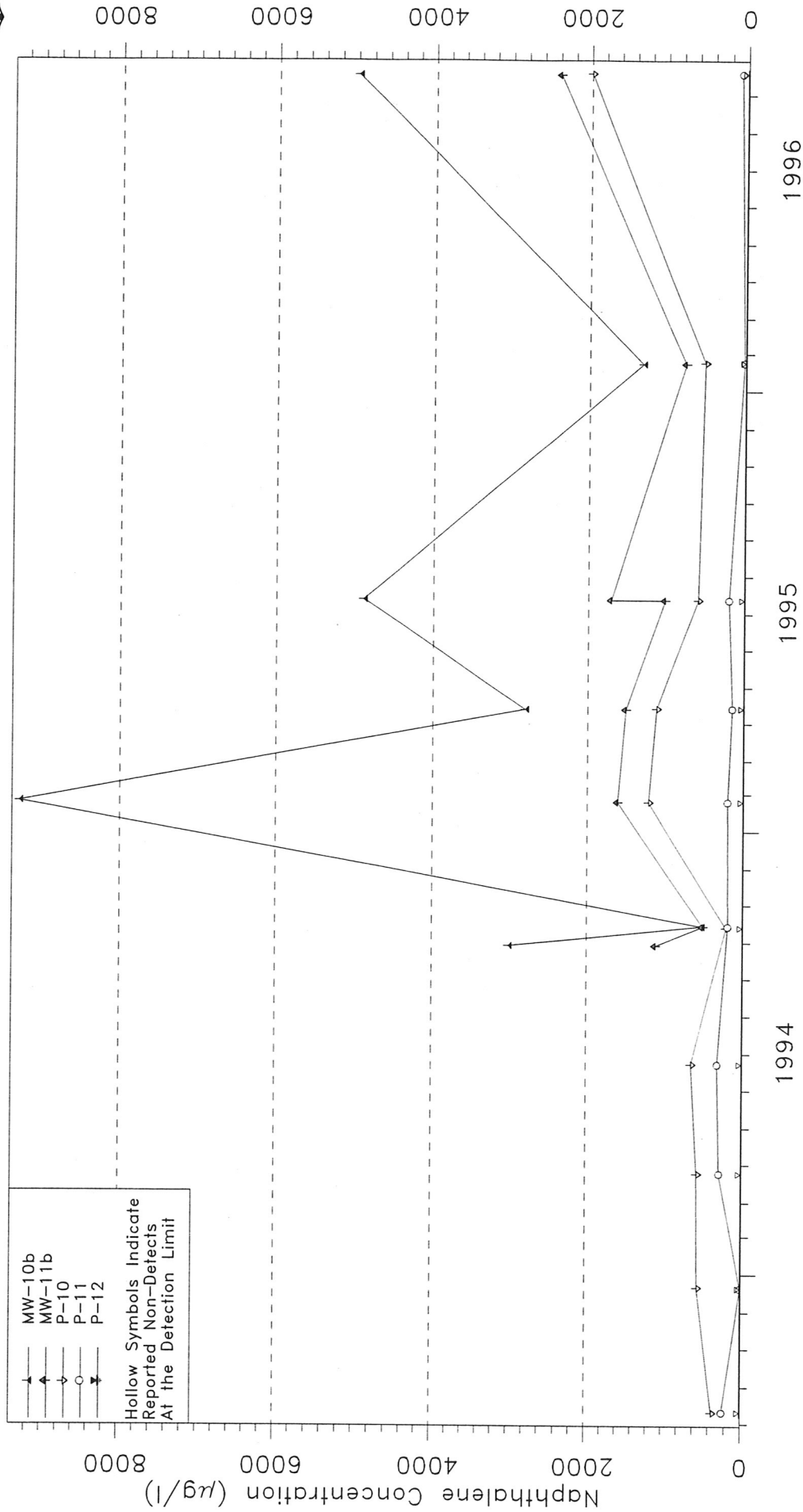


Figure 6: Concentration of Naphthalene Versus Time for STZ WELLS



Acenaphthene

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

Terranext

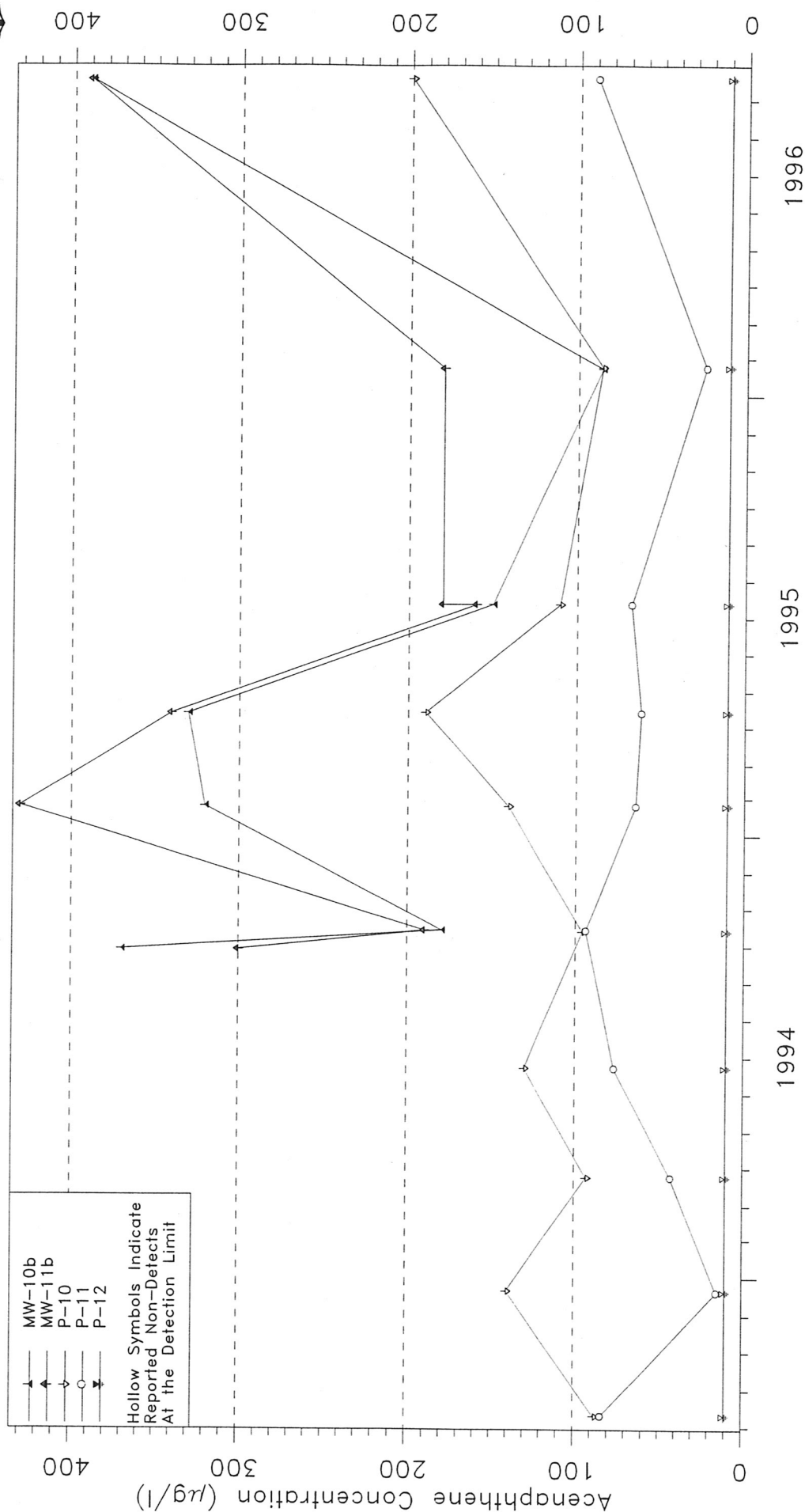


Figure 7: Concentration of Acenaphthene Versus Time for STZ WELLS



Total BTEX

Data Evaluations: Houston Wood Preservatives Works Site, Houston, TX

Terranex

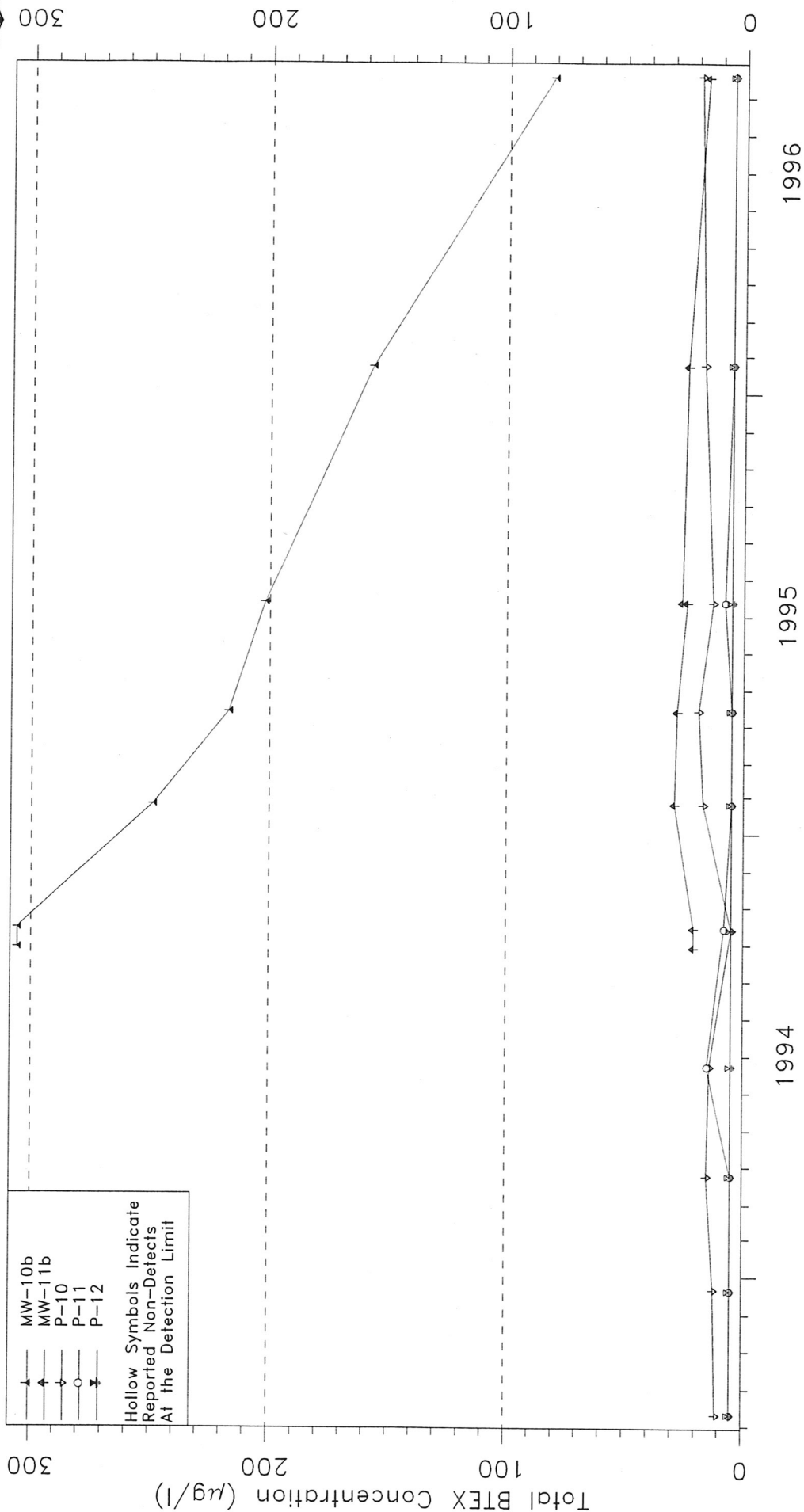


Figure 8: Concentration of Total BTEX Versus Time for STZ WELLS

The statistical methods outlined in the RCRA Facility Investigation Work Plan are currently being applied to the available data. It is anticipated that results of the statistical evaluation will be presented in the first Semi-annual Report for 1997 for this site.

2.3 Summary of Inspections and Remedial Activities Conducted

By letter of January 10, 1995, the TNRCC acknowledged fulfillment of the requirement of Compliance Plan Provision XI.B by the Operation & Maintenance (O&M) Plan, dated August 19, 1994, together with the addendum to the O&M Plan, dated December 8, 1994. Under this O&M Plan, inspections of the surface impoundment and monitor wells were conducted monthly. O&M Plan Amendment 2, dated May 20, 1995, was submitted to the TNRCC on May 21, 1995; O&M Plan Amendment 3, dated June 23, 1995, was submitted to the TNRCC on August 8, 1995. By letter of October 13, 1995, the TNRCC provided approval of the amendments to the O&M Plan. O&M Amendment 3 establishes a weekly schedule for the surface impoundment and a quarterly inspection schedule for the monitor wells.

Inspection of the integrity of the well casings was conducted quarterly during January, April, September, and December, 1996. Inspections related to hazardous waste generation for container storage are performed weekly.

2.4 Summary of Annual Cost Estimate for Post-Closure Care

An adjusted annual cost estimate for post-closure care in 1997 is presented in Appendix C. The post-closure care cost estimate includes ground water monitoring, inspection, and operation and maintenance costs averaged on an annual basis. Ground water monitoring includes quarterly and semi-annual sampling and analytical testing for an estimated total of

21 monitor wells/piezometers. Operation and maintenance include minor repairs and upgrades. Costs for replacement of existing monitor wells are not included.

2.5 Certification of Waste Minimization

The volume and toxicity of IDW are directly controlled by the activities required by the Permit and Compliance Plan. The scope and schedule of activities proposed in the RFI and EOC Work Plans, as approved by the TNRCC, were designed to reduce the volume and toxicity of the IDW generated by the facility investigations to the degree determined to be economically practicable and in accord with the requirements of the Permit and Compliance Plan requirements. Waste minimization has occurred and will continue through use of direct-push and Hydropunch™ techniques as outlined in the Work Plans, thereby potentially reducing the number of borings/wells and waste that could be generated.

Given the nature of the contaminants potentially present at the facility, the requirements of the Permit and Compliance Plan in investigating the facility, and the character of the IDW generated to date, the method of treatment, storage, or disposal of IDW is that practicable method currently available to the permittee which minimizes the present and future threat to human health and the environment.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS FOR UTZ
(El +35-FOOT SAND ZONE) MONITOR WELLS
First Semi-annual Event 1996

ANALYTICAL RESULTS (µg/L)										
COMPOUND	MW-1a	MW-2	MW-3	MW-4	MW-5	MW-7	MW-8	MW-9	MW-10a	MW-11a
BENZENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
CHLOROBENZENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-DICHLOROETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
DICHLOROMETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
ETHYLBENZENE	13	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
TOLUENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
XYLENES	27	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
ACENAPHTHENE	94	ND<10	80	40	ND<10	ND<10	19	ND<10	36	46
ACENAPHTHYLENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
ANTHRACENE	10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)ANTHRACENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-ETHYLHEXYL)PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-CHLOROETHOXY)METHANE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2-CHLORONAPHTHALENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
CHRYSENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DIBENZOFURAN	52	ND<10	28	15	ND<10	ND<10	ND<10	ND<10	ND<10	28
2,4-DIMETHYLPHENOL	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DI-N-BUTYL PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4,6-DINITRO-O-CRESOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
2,4-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2,6-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
1,2-DIPHENYLHYDRAZINE	ND<10	ND<10	96	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
FLUORANTHENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
FLUORENE	76	ND<10	55	28	ND<10	ND<10	18	ND<10	18	30
2-METHYLNAPHTHALENE	57	ND<10	ND<10	14	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
NAPHTHALENE	250	ND<10	94	130	ND<10	ND<10	42	ND<10	210	110
NITROBENZENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4-NITROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
N-NITROSODIPHENYLAMINE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PENTACHLOROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
PHENANTHRENE	43	ND<10	16	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	13
PHENOL	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 2
SUMMARY OF ANALYTICAL RESULTS FOR STZ
(EI +15-FOOT SAND ZONE) MONITOR WELLS AND PIEZOMETERS
First Semi-annual Event 1996

ANALYTICAL RESULTS (µg/L)					
COMPOUND	P-10	P-11	P-12	MW-10b	MW-11b
BENZENE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
CHLOROBENZENE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
1,2-DICHLOROETHANE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
DICHLOROMETHANE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
ETHYLBENZENE	11	ND < 5	ND < 5	46	12
TOLUENE	ND < 5	ND < 5	ND < 5	13	ND < 5
XYLENES	6	ND < 5	ND < 5	98	12
ACENAPHTHENE	86	24	ND < 10	86	180
ACENAPHTHYLENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
ANTHRACENE	11	ND < 10	ND < 10	10	22
BENZO(A)ANTHRACENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
BENZO(A)PYRENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
BIS(2-ETHYLHEXYL)PHTHALATE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
BIS(2-CHLOROETHOXY)METHANE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
2-CHLORONAPHTHALENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
CHRYSENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
DIBENZOFURAN	12	ND < 10	ND < 10	57	59
2,4-DIMETHYLPHENOL	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
DI-N-BUTYL PHTHALATE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
4,6-DINITRO-O-CRESOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
2,4-DINITROTOLUENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
2,6-DINITROTOLUENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
1,2-DIPHENYLHYDRAZINE	ND < 10	ND < 10	ND < 10	ND < 10	98
FLUORANTHENE	ND < 10	ND < 10	ND < 10	ND < 10	19
FLUORENE	50	ND < 10	ND < 10	50	140
2-METHYLNAPHTHALENE	38	ND < 10	ND < 10	87	43
NAPHTHALENE	510	26	ND < 10	1300	750
NITROBENZENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
4-NITROPHENOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
N-NITROSODIPHENYLAMINE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
PENTACHLOROPHENOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
PHENANTHRENE	37	ND < 10	ND < 10	46	160
PHENOL	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
PYRENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 3
SUMMARY OF ANALYTICAL RESULTS FOR UTZ
(E1 +35-FOOT SAND ZONE) MONITOR WELLS
Second Semi-annual Event 1996

ANALYTICAL RESULTS (µg/L)										
COMPOUND	MW-1a	MW-2	MW-3	MW-4	MW-5	MW-7	MW-8	MW-9	MW-10a	MW-11a
BENZENE	9	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
CHLOROBENZENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-DICHLOROETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
DICHLOROMETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
ETHYLBENZENE	31	13	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
TOLUENE	12	7	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
XYLENES	48	17	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	5	ND<5
ACENAPHTHENE	460	110	150	60	50	20	ND<10	ND<10	49	150
ACENAPHTHYLENE	10	ND<10	ND<10	ND<10	20	ND<10	ND<10	ND<10	ND<10	ND<10
ANTHRACENE	30	ND<10	10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)ANTHRACENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-ETHYLHEXYL)PHTHALATE	ND<10	ND<10	ND<10	20	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-CHLOROETHOXY)METHANE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2-CHLORONAPHTHALENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
CHRYSENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DIBENZOFURAN	240	80	110	30	20	ND<10	ND<10	ND<10	19	70
2,4-DIMETHYLPHENOL	20	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DI-N-BUTYL PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4,6-DINITRO-O-CRESOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
2,4-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2,6-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
1,2-DIPHENYLHYDRAZINE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
FLUORANTHENE	20	ND<10	20	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	10
FLUORENE	280	70	110	40	20	ND<10	ND<10	ND<10	30	80
2-METHYLNAPHTHALENE	670	ND<10	ND<10	20	20	ND<10	ND<10	ND<10	24	60
NAPHTHALENE	5050	478	79	224	736	ND<10	ND<10	ND<10	582	468
NITROBENZENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4-NITROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
N-NITROSODIPHENYLAMINE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PENTACHLOROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
PHENANTHRENE	140	10	50	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	40
PHENOL	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PYRENE	ND<10	ND<10	10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR STZ
(EI +15-FOOT SAND ZONE) MONITOR WELLS AND PIEZOMETERS
Second Semi-annual Event 1996

ANALYTICAL RESULTS (µg/L)					
COMPOUND	P-10	P-11	P-12	MW-10b	MW-11b
BENZENE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
CHLOROBENZENE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
1,2-DICHLOROETHANE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
DICHLOROMETHANE	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
ETHYLBENZENE	10	ND < 5	ND < 5	27	7
TOLUENE	ND < 5	ND < 5	ND < 5	6	ND < 5
XYLENES	9	ND < 5	ND < 5	48	9
ACENAPHTHENE	200	90	ND < 10	390	390
ACENAPHTHYLENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
ANTHRACENE	10	ND < 10	ND < 10	30	40
BENZO(A)ANTHRACENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
BENZO(A)PYRENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
BIS(2-ETHYLHEXYL)PHTHALATE	ND < 10	20	30	20	ND < 10
BIS(2-CHLOROETHOXY)METHANE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
2-CHLORONAPHTHALENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
CHRYSENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
DIBENZOFURAN	50	50	ND < 10	200	24
2,4-DIMETHYLPHENOL	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
DI-N-BUTYL PHTHALATE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
4,6-DINITRO-O-CRESOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
2,4-DINITROTOLUENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
2,6-DINITROTOLUENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
1,2-DIPHENYLHYDRAZINE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
FLUORANTHENE	10	ND < 10	ND < 10	20	30
FLUORENE	110	50	ND < 10	250	250
2-METHYLNAPHTHALENE	130	ND < 10	ND < 10	300	250
NAPHTHALENE	2010	75	ND < 10	4900	2440
NITROBENZENE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
4-NITROPHENOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
N-NITROSODIPHENYLAMINE	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
PENTACHLOROPHENOL	ND < 50	ND < 50	ND < 50	ND < 50	ND < 50
PHENANTHRENE	70	10	ND < 10	210	260
PHENOL	ND < 10	ND < 10	ND < 10	ND < 10	ND < 10
PYRENE	ND < 10	ND < 10	ND < 10	10	20

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 5
SEMI-ANNUAL WATER LEVEL DEPTHS AND ELEVATIONS
January and September 1996

UTZ Well	Total Depth		Reference Elevation	Depth to Water		Water Level Elevation	
	1ST SA	2ND SA		1ST SA	2ND SA	1ST SA	2ND SA
MW-1a	19.45	19.44	47.97	5.67	8.33	42.30	39.64
MW-2	18.39	18.40	48.05	5.69	8.84	42.36	39.21
MW-3	19.95	19.93	48.63	6.27	9.31	42.36	39.32
MW-4	22.59	22.03	49.91	7.85	10.09	42.06	39.82
MW-5	22.20	27.23	49.60	7.42	9.01	42.18	40.59
MW-7	24.56	24.61	47.71	6.99	9.41	40.72	38.30
MW-8	24.93	24.91	49.37	7.20	9.51	42.17	39.86
MW-9	25.22	25.25	48.81	7.09	8.58	41.72	40.23
MW-10a	25.38	25.42	49.90	7.74	10.54	42.16	39.36
MW-11a	23.79	23.86	50.03	8.01	10.56	42.02	39.47
STZ Well/ Piezometer	1ST SA	2ND SA	Reference Elevation	1ST SA	2ND SA	1ST SA	2ND SA
MW-10b	46.35	46.35	49.96	7.84	10.64	42.12	39.32
MW-11b	46.52	46.56	50.19	8.20	10.83	41.99	39.36
P-10	42.70	42.74	48.87	5.84	8.34	43.03	40.53
P-11	42.61	42.64	49.02	6.81	9.15	42.21	39.87
P-12	42.73	42.77	49.29	6.62	8.12	42.67	41.17

Depth and elevation measurements are given in feet: depths relative to Reference Elevation point and elevations relative to Mean Sea Level
UTZ - Upper Transmissive Zone
STZ - Secondary Transmissive Zone

TABLE 6
COMPLIANCE OF WELLS AND PIEZOMETERS
WITH GROUND WATER PROTECTION STANDARD

Monitoring Point	First Semi-annual		Second Semi-annual	
UTZ Well	Compliant	Non-Compliant	Compliant	Non-Compliant
MW-1a		X		X
MW-2	X			X
MW-3		X		X
MW-4		X		X
MW-5	X			X
MW-7	X			X
MW-8		X	X	
MW-9	X		X	
MW-10a		X		X
MW-11a		X		X
STZ Well/Piezometer	Compliant	Non-Compliant	Compliant	Non-Compliant
MW-10b		X		X
MW-11b		X		X
P-10		X		X
P-11		X		X
P-12	X			X

APPENDIX A
ANNUAL WASTE SUMMARY
FOR DATA YEAR 1996

ANNUAL WASTE SUMMARY (1) FOR DATA YEAR: 1996

TELEPHONE: (512) 239-6832

Mr. E.H. Honig, P.E.
Union Pacific Railroad
1416 Dodge St., RM 930
Omaha, NE 68179

TEXAS WASTE CODE 000130411

QUANTITY HANDLED

RECEIVER'S EPA ID #

COMMENTS

Waste oil. The waste oil is generated primarily by the boring of

Waste oil. The waste oil is generated from four (4) for

Waste generated in state only - does not include maquiladora & foreign waste

Enter one letter: P = pounds, T = tons (2000 lb), K = kilograms

See Instructions re: Exemptions from hazardous waste generation Fee

ANNUAL WASTE SUMMARY
FOR DATA YEAR: 1996
REPORT FOR: 1996
G 1
31547
1
10
TXD000820266
Your EPA ID #
NO REPORT REQUIRED { See 30 TAC 335.9 (a)(3); also see instructions }
Page 3 of 5

SUMMARY STATUS
[X] ORIGINAL SUMMARY
[] REVISED SUMMARY
[] SUPPLEMENTAL SUMMARY

Mr. E.H. Honig, P.E.
Union Pacific Railroad
1416 Dodge St., RM 930
Omaha, NE 68179

TELEPHONE: (512) 239-6632

TEXAS WASTE CODE 0909101H-
QUANTITY HANDLED
EPA HAZARDOUS WASTE NO. 31
SYSTEM TYPE CODE 35
FEE ** 70
FACILITY NUMBER 39
EPA HAZARDOUS WASTE NO. 43
RECEIVER'S EPA ID #
COMMENTS
Aqueous waste with low surfactants. Groundwater generat

TEXAS WASTE CODE 0912489H-
QUANTITY HANDLED
EPA HAZARDOUS WASTE NO. 31
SYSTEM TYPE CODE 35
FEE ** 70
FACILITY NUMBER 39
EPA HAZARDOUS WASTE NO. 43
RECEIVER'S EPA ID #
COMMENTS
Creosote sludge soil mixture. This mixture is generate

Waste generated in state only - does not include maquiladora & foreign waste
Enter one letter: P = pounds, T = tons (2000 lb), K = kilograms
See instructions re: Exemptions from hazardous waste generation Fee

ANNUAL WASTE SUMMARY
FOR DATA YEAR: 1996
TELEPHONE: (512) 239-6632
Mr. E.H. Honig, P.E.
Union Pacific Railroad
1416 Dodge St., RM 930
Omaha, NE 68179

TEXAS WASTE CODE 0914101H
QUANTITY HANDLED
UNITS *
EPA HAZARDOUS WASTE NO. K001
SYSTEM TYPE CODE M134
FEE ** 70
FACILITY NUMBER 30567
EPA HAZARDOUS WASTE NO. 43
RECEIVER'S EPA ID # TXD097673149
COMMENTS
Aqueous waste with low solvents. Groundwater generated

TEXAS WASTE CODE 0915301H
QUANTITY HANDLED
UNITS *
EPA HAZARDOUS WASTE NO. 31
SYSTEM TYPE CODE M
FEE ** 70
FACILITY NUMBER 39
EPA HAZARDOUS WASTE NO. 43
RECEIVER'S EPA ID #
COMMENTS
Soil contaminated with organics. The soil is derived fr

Waste generated in state only - does not include maquiladora & foreign waste
* Enter one letter: P = pounds, T = tons (2000 lb), K = kilograms, Exemptions from hazardous waste generation Fee

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Preparer (PRINT NAME) William R Goldsby
Authorized Agent (PRINT NAME) JACIL J. GARCIA
Signature of Preparer
Signature of Authorized Agent
Date 1-23-97
Date 1-23-97

APPENDIX B

**POTENTIAL CONTAMINANTS OF CONCERN
AND CONCENTRATION LIMITS
FOR GROUND WATER PROTECTION STANDARD**

**POTENTIAL CONTAMINANTS OF CONCERN
AND CONCENTRATION LIMITS FOR GROUND WATER PROTECTION STANDARD**

Hazardous Constituents	Detection Limits (mg/l)
Acenaphthene	ND (0.010)
Acenaphthylene	ND (0.010)
Anthracene	ND (0.010)
Benzene	ND (0.005)
Benzo(A)anthracene	ND (0.010)
Benzo(A)pyrene	ND (0.010)
Bis(2-ethylhexyl)phthalate	ND (0.010)
Bis(2-chloroethoxy)methane	ND (0.010)
Chlorobenzene	ND (0.005)
2-Chloronaphthalene	ND (0.010)
Chrysene	ND (0.010)
Dibenzofuran	ND (0.010)
1,2-Dichloroethane	ND (0.005)
Dichloromethane (Methylene chloride)	ND (0.005)
2,4-Dimethylphenol	ND (0.010)
Di-n-butyl phthalate	ND (0.010)
4,6-Dinitro-o-cresol	ND (0.050)
2,4-Dinitrotoluene	ND (0.010)
2,6-Dinitrotoluene	ND (0.010)
1,2-Diphenylhydrazine	ND (0.010)
Ethylbenzene	ND (0.005)
Fluoranthene	ND (0.010)
Fluorene	ND (0.010)
2-Methylnaphthalene	ND (0.010)
Naphthalene	ND (0.010)
Nitrobenzene	ND (0.010)
4-Nitrophenol	ND (0.050)
N-Nitrosodiphenylamine	ND (0.010)
Pentachlorophenol	ND (0.050)
Phenanthrene	ND (0.010)
Phenol	ND (0.010)
Pyrene	ND (0.010)
Toluene	ND (0.005)
Xylenes	ND (0.005)

APPENDIX C
POST-CLOSURE CARE COST ESTIMATE

POST-CLOSURE CARE COST CALCULATION

**Union Pacific Rail Road
(formerly Southern Pacific Transportation Company)
Former Houston Wood Preserving Works
4910 Liberty Road
Houston, Texas**

**Surface Impoundment
Post-Closure Care Permit HW-50343-000
Industrial Solid Waste Registration No. 31547**

Ground Water Monitoring

21 wells sampled quarterly and/or semi-annually = \$60,000

Operation & Maintenance

Miscellaneous weekly/monthly inspections & repairs = \$ 22,000

1997 Annual Total = \$82,000