

**New Pump and Treat Facility  
Annual Operations Report,  
October 2004 through  
September 2005, Test Area  
North Final Groundwater  
Remedy, Operable Unit 1-07B**

December 2005

**Idaho  
Cleanup  
Project**

The Idaho Cleanup Project is operated for the  
U.S. Department of Energy by CH2M ♦ WG Idaho, LLC

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**New Pump and Treat Facility Annual Operations  
Report, October 2004 through September 2005,  
Test Area North Final Groundwater Remedy,  
Operable Unit 1-07B**

**December 2005**

**Idaho Cleanup Project  
Idaho Falls, Idaho 83415**

**Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environmental Management  
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## **ABSTRACT**

The New Pump and Treat Facility is a component of the groundwater remedy for a portion of a plume of dissolved volatile organic compounds in the Snake River Plain Aquifer beneath Test Area North, and is a facility located at the Idaho National Laboratory. This report documents New Pump and Treat Facility operations during Fiscal Year 2005 (October 1, 2004–September 30, 2005). The New Pump and Treat Facility began routine operations on October 1, 2001, and operated continuously through March 1, 2005 when it was placed on standby in support of the medial zone rebound test. During Fiscal Year 2005, the New Pump and Treat Facility met all operational goals. Throughout the reporting period, the extraction flow rate was within prescribed limits during all operational periods, effluent concentration limits were met, and air discharge limits were not exceeded.



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## ACRONYMS

DCE	dichloroethene
DEQ	[Idaho] Department of Environmental Quality
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EPA	U.S. Environmental Protection Agency
FY	fiscal year
GWTF	Groundwater Treatment Facility
INL	Idaho National Laboratory
NPTF	New Pump and Treat Facility
OU	operable unit
PCE	tetrachloroethene
SP	sampling point
TAN	Test Area North
TCE	trichloroethene
TSF	Technical Support Facility
VC	vinyl chloride
VOC	volatile organic compound





# **New Pump and Treat Facility Annual Operations Report, October 2004 through September 2005, Test Area North Final Groundwater Remedy, Operable Unit 1-07B**

## **1. INTRODUCTION**

This Annual Operations Report documents Fiscal Year (FY) 2005 operations of the New Pump and Treat Facility (NPTF). The NPTF began routine operations on October 1, 2001, and operated continuously through March 1, 2005 when it was placed on standby in support of the medial zone rebound test. The two-year rebound test was initiated as a result of the relatively low concentration of contaminants in NPTF influent (Wymore et al. 2004). Additional details concerning the rebound study can be found in the referenced document. The NPTF is operated as part of the Test Area North (TAN) Operable Unit (OU) 1-07B groundwater remedy at the Idaho National Laboratory (INL), as described in the *Record of Decision Declaration for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites Final Remedial Action* (DOE-ID 1995). Although this Record of Decision was amended in September 2001 (DOE-ID 2001), the pump and treat portion of the remedy was not affected by the modification. The NPTF is operated in accordance with the *New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003a) and the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). Associated sampling of groundwater-monitoring wells in the vicinity is described in the *Sampling and Analysis Plan for the New Pump and Treat Facility Performance Monitoring Test Area North, Operable Unit 1-07B* (INEEL 2001). This Annual Operations Report provides information on the fourth year of NPTF operation, compliance, and performance, as required by the aforementioned documents.

The specific meanings of three terms used in this document are listed below:

- *Operations* refers to the routine activities associated with maintaining and running the NPTF
- *Compliance* refers to the NPTF being operated within air- and water-effluent discharge limits
- *Performance* refers to the function of the NPTF relative to requirements to clean up the medial zone of the groundwater plume and to capture the contaminated groundwater that emanates from the “hotspot” near the former TSF-05 injection well.

### **1.1 Overview of the New Pump and Treat Facility**

The NPTF is a pump and treat system that is operated to clean up the medial zone of the groundwater plume and prevent the contaminated groundwater from migrating further downgradient (see Figure 1-1). Major components of the pump and treat system include (1) a network of groundwater extraction wells (i.e., TAN-38, TAN-39, and TAN-40), (2) an aboveground treatment system that uses two air strippers to reduce concentrations of volatile organic compounds (VOCs) to less than maximum contaminant levels, and (3) an injection well (i.e., TAN-53A) used to inject treated water back into the aquifer. Locations of the NPTF and surrounding wells are shown in Figure 1-1.

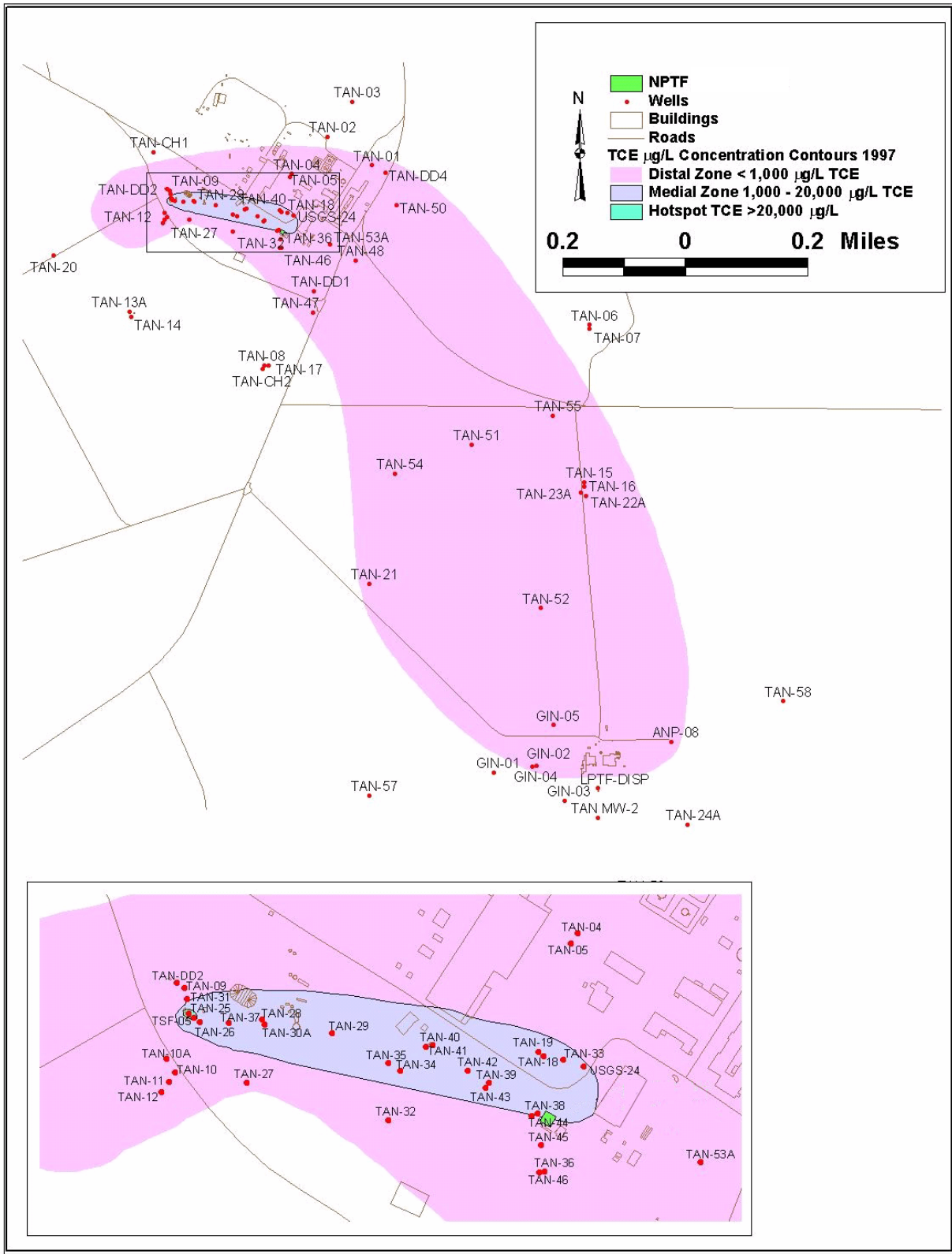


Figure 1-1. Medial zone of the contaminated groundwater plume at Test Area North.

## 2. SUMMARY OF OPERATIONS

The NPTF began routine operations on October 1, 2001, and it was operated continuously through March 1, 2005, when it was placed on standby in support of the medial zone rebound test. During routine NPTF operations, contaminated groundwater is processed at a flow rate of 120 to 250 gpm. The actual flow rate of the NPTF during the reporting period is illustrated in Figure 2-1. The height of the area for each well corresponds to the extraction rate for that well, and the total height of the areas corresponds to the total flow rate. The 12-month average (percentage) uptime was 97.3% when the facility was placed on standby March 1, 2005. This exceeds the uptime goal of 90%. Table 2-1 summarizes NPTF operations for FY 2005.

After being placed on standby, the NPTF operated for approximately three days each month using potable water to process purge water generated from groundwater sampling and well-drilling activities. All purge water was managed in accordance with applicable procedures throughout the reporting period. Appendix A summarizes the purge water processed through the NPTF during FY 2005.

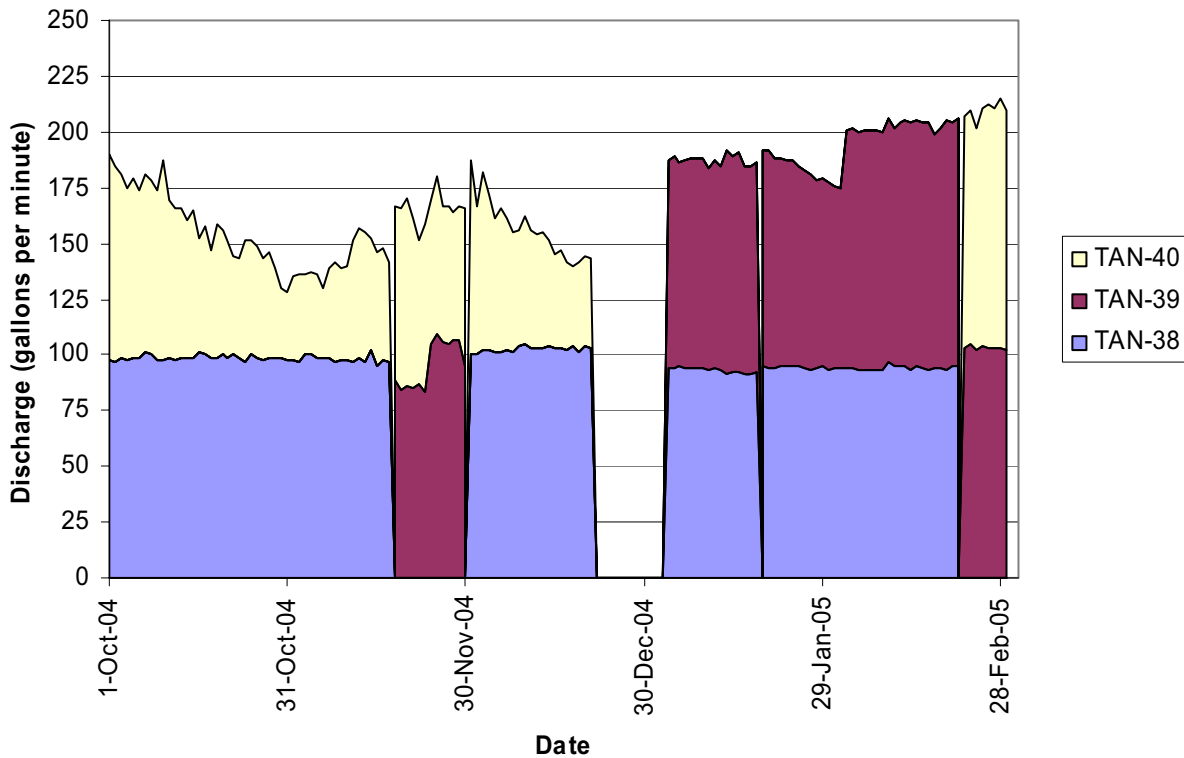


Figure 2-1. Flow rate from the New Pump and Treat Facility extraction wells.

Table 2-1. New Pump and Treat Facility operations summary for Fiscal Year 2005.

Period	Operating Hours		Gallons Processed	Monthly Uptime (%)	Rolling Average <sup>a</sup> (12 months) Uptime (%)
	Possible	Actual			
October	504	504	5,705,362	100	99.0
November	672	672	7,435,174	100	99.1
December	672	669	9,068,564	99.6	99.2
January	1032	784	8,457,843	76.0	97.2
February	480	480	6,346,202	100	97.2
March	191	191	2,519,388	100	97.3
April <sup>b</sup>	—	<i>17</i>	—	—	—
May <sup>b</sup>	—	<i>13.5</i>	—	—	—
June <sup>b</sup>	—	<i>14</i>	—	—	—
July <sup>b</sup>	—	<i>12</i>	—	—	—
August <sup>b</sup>	—	<i>11.5</i>	—	—	—
September <sup>b</sup>	—	<i>13</i>	—	—	—
Total FY 2005	3,300		39,532,533	—	97.8
Total FY 2004	8,904	8,817	104,971,063	—	99
Total FY 2003	8,712	8,550	103,140,278	—	98.1
Total FY 2002	8,736	8,568	119,259,910	—	98.1
Grand Total	26,352	25,935	366,903,784	—	98.4

a. The rolling average is calculated each month and is based on the previous 12 months of operation.

b. While on standby operations, the facility was operated using potable water on a monthly basis to process purge water generated during monthly Operable Unit 1-07B groundwater sampling activities. Numbers in italicized text indicate the number of hours the facility was operated using potable water.

FY = fiscal year

## 2.1 Inspections, Operational Issues, and Corrective Maintenance

The inspection requirements for the NPTF are described in Section 3.3 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). Inspections were performed daily throughout FY 2005 in accordance with applicable procedures except as noted below. The facility was rinsed and placed on standby for the period December 22, 2004, through January 3, 2005, as a result of the Sitewide holiday work curtailment. As agreed upon with the Agencies (i.e., U.S. Department of Energy [DOE], U.S. Environmental Protection Agency [EPA], and Idaho Department of Environmental Quality [DEQ]), daily inspections of the NPTF were not required once the facility was rinsed with potable water. In addition to the holiday work curtailment, one formal daily inspection was not completed on January 8, 2005, as a result of extreme winter weather. On this date, all roads to the INL Site were closed. As a result, NPTF

operators contacted TAN personnel who were on-Site and had them look in the windows to ensure that the facility was operating normally. No off-normal conditions were noted. Normal inspections resumed on January 9, 2005, when the roads were again open.

The NPTF operated continuously throughout the reporting period, except for two unplanned and three planned shutdowns. The unplanned shutdowns resulted from a high water level alarm in the surge tank. The high water level alarm was caused by foaming while the NPTF was used to process well purge water that contained high concentrations of whey. Recovery from the unplanned shutdowns was accomplished by waiting for the foam to dissipate and restarting the NPTF. The issue was resolved by modifying the operating procedure to allow manual operation of the facility while it is manned. Planned shutdowns were performed to support TAN-wide power outages, maintain software, complete drawdown tests, and conduct annual facility testing (e.g., flow meter tests and tank water-level meter tests). During the shut down for the holiday curtailment, the air stripper trays were cleaned out using a pressure washer to remove hard water deposits. No other corrective maintenance was performed during the reporting period. Appendix B provides additional detail about facility operations.



### 3. COMPLIANCE MONITORING EVALUATION

Compliance monitoring is conducted to ensure that the NPTF effluents meet water- and air-discharge limits and to track influent contaminant concentrations. During the reporting period, contaminant concentrations in water and air effluents were below discharge limits.

#### 3.1 Influent Concentrations

The requirements for monitoring the concentration of contaminants in NPTF influent are shown in Table 4-1 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). While the NPTF is on standby and per agency agreement, the required compliance monitoring frequency has been changed from monthly to quarterly.<sup>a</sup> At the conclusion of the rebound study, the compliance monitoring frequency will be changed back to monthly. The VOC and radionuclide concentrations measured in samples collected from the NPTF influent are shown in Figure 3-1. These data are tabulated in Appendix C. Generally, concentrations of VOCs in NPTF influent samples showed a decreasing trend until the NPTF was placed into standby operation. Changes in contaminant concentrations observed before standby operations began are a result of changes in extraction pump operating configuration.

Concentrations of VOCs in NPTF influent samples collected after standby operations began were below detection limits with the exception of trichloroethene (TCE). Radionuclide data are tabulated in Appendix C but were not plotted. Throughout the fiscal year, Sr-90 and H-3 were at or below detection limits, and no trend was discernible. The completeness for collection of NPTF influent samples was 100%.

#### 3.2 Water Effluent Emissions

The VOC and radionuclide concentrations in water discharged from the NPTF must be below maximum contaminant levels.<sup>b</sup> Furthermore, the cumulative carcinogenic risk due to VOCs must be less than  $1 \times 10^{-5}$ .<sup>c</sup> Tabulated contaminant concentration data for the NPTF effluent are shown in Appendix C. The NPTF effluent met water effluent discharge limits throughout FY 2005. The concentration of TCE and all other VOCs in NPTF effluent water was below the method detection limit. As indicated in Appendix C of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b), contaminant concentrations less than the applicable method detection limit are not included in the cumulative risk calculation. As a result, the cumulative carcinogenic risk of NPTF effluent is zero for all samples collected. The concentrations of radionuclide contaminants of concern in NPTF effluent also were below the applicable maximum contaminant levels (see Appendix C). Hence, the water effluent was within acceptable limits during the reporting period.

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a. Lane Butler, Letter to Mr. Richard Provencher, "Change in Compliance Sampling Frequency from Monthly to Quarterly for the Operable Unit 1-07B, New Pump and Treat Facility," CCN300891, August, 2005.

b. Karl J. Dreher, Idaho Department of Water Resources, Letter to C. Stephen Allred, Idaho Department of Environmental Quality, April 3, 2001, "Injection of Amendments and Treated Ground Water into the Eastern Snake Plain Aquifer (ESPA) in Support of Remedial Actions at Test Area North (TAN) OU 1-07B, INEEL."

c. Brian R. Monson, Idaho Department of Environmental Quality, Letter to Dave Wessman, U.S. Department of Energy Idaho Operations Office, February 5, 2001, "August 8, 2001, and January 12, 2001, Request of a 'No Longer Contained-In' Determination for Operable Unit 1-07B Remediated Water at the INEEL, EPA ID No. ID4890008952."



### 3.3 Air Emissions

Limits for VOCs discharged from the NPTF to the atmosphere are described in the *New Pump and Treat Facility Remedial Design Test Area North Operable Unit 1-07B* (DOE-ID 2000). Sample collection, analysis, and validation requirements for monitoring air effluent are described in Table 4-1 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b).

Concentrations of VOC contaminants of concern in NPTF air effluent remained relatively static throughout the reporting period (see Figure 3-2). Mass flow rates of VOCs discharged from the NPTF air strippers to the atmosphere were below the respective air discharge limits throughout the reporting period (see Figure 3-2).

The VOC emissions from NPTF air strippers to the atmosphere were calculated in two ways. The first approach was to calculate the VOC mass flow rate using VOC concentrations measured in air stripper off-gas samples (the air effluent approach). The second approach was to assume that all VOCs dissolved in NPTF influent were discharged to the atmosphere and to calculate the VOC mass influx to the NPTF (the water influent approach). Comparison of results from two independent calculation methods provides an order of magnitude check on the calculations as the uncertainty associated with each measurement is  $\pm 30\%$ . Calculation results are included in Table C-10 in Appendix C.

#### 3.3.1 Air Effluent Approach

The mass of VOCs discharged to the atmosphere from the air strippers was calculated as the product of measured VOC concentrations in samples collected from air stripper off-gas sample points and the volumetric flow rate of air discharged from the air strippers. The mass flow rates of TCE, tetrachloroethene (PCE), *cis*-1,2-dichloroethene (DCE), and vinyl chloride were below their respective discharge limits (see Figure 3-2). Vinyl chloride was not detected in any gaseous samples and is not included in Figure 3-2.

#### 3.3.2 Water Influent Approach

If the air strippers in the NPTF were 100% efficient at transferring VOCs from water to air, then the mass flow rate of VOCs discharged to the atmosphere would equal the mass flow rate of VOCs dissolved in water entering the NPTF. Because the actual air stripper removal efficiency is somewhat less than 100%, the actual mass flow rate discharged to the atmosphere is less than the influent mass flow rate. Therefore, the influent VOC mass flow rate is an upper bound on the VOC mass flow rate discharged to the atmosphere. The VOC emissions from the NPTF to the atmosphere were calculated as the product of VOC concentrations measured at the influent sample point and the average monthly combined process flow rate shown in Figure 3-2.

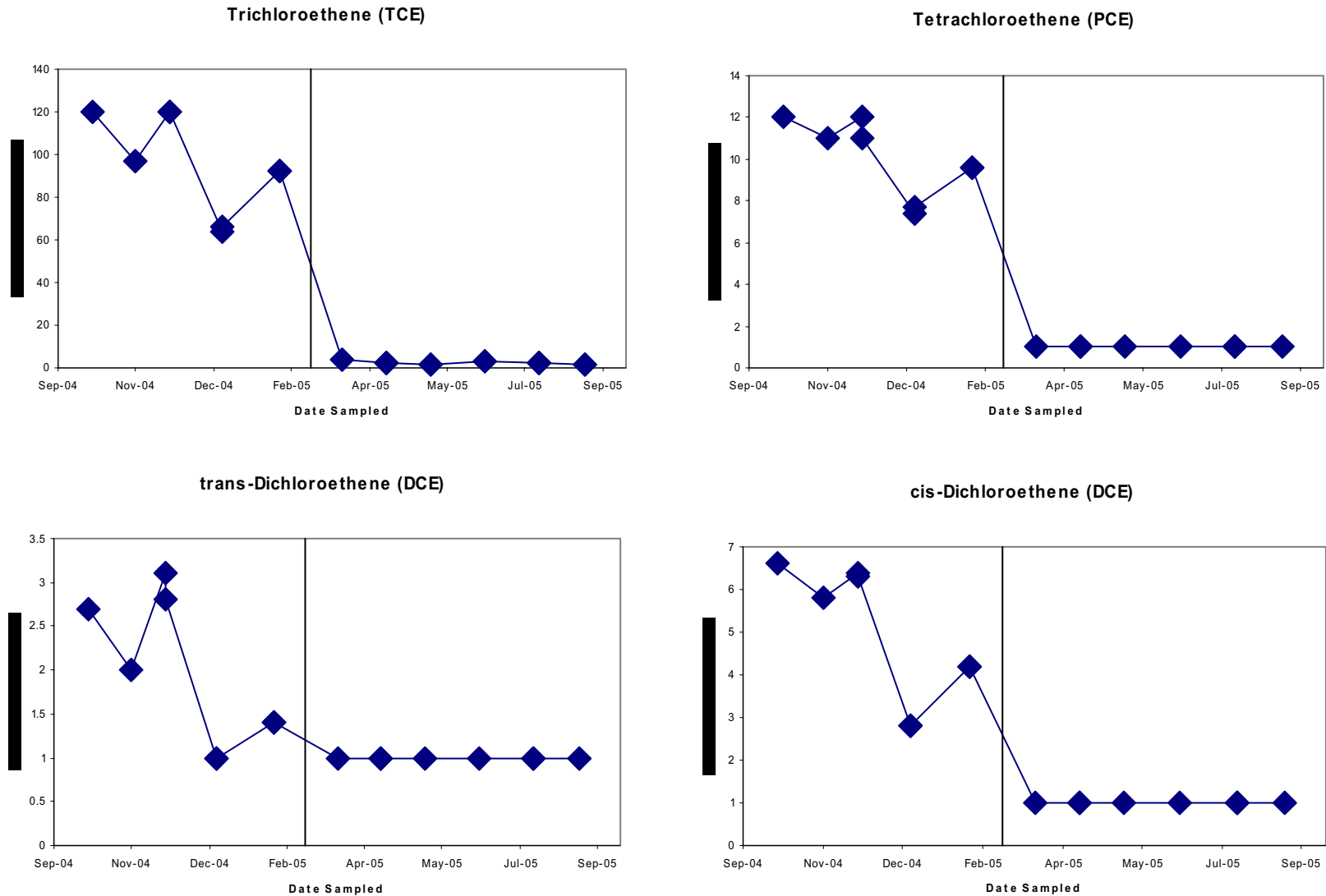


Figure 3-1. Contaminant of concern concentrations in New Pump and Treat Facility influent. The black vertical lines in each plot represent March 1, 2005, the day the New Pump and Treat Facility was placed on standby.

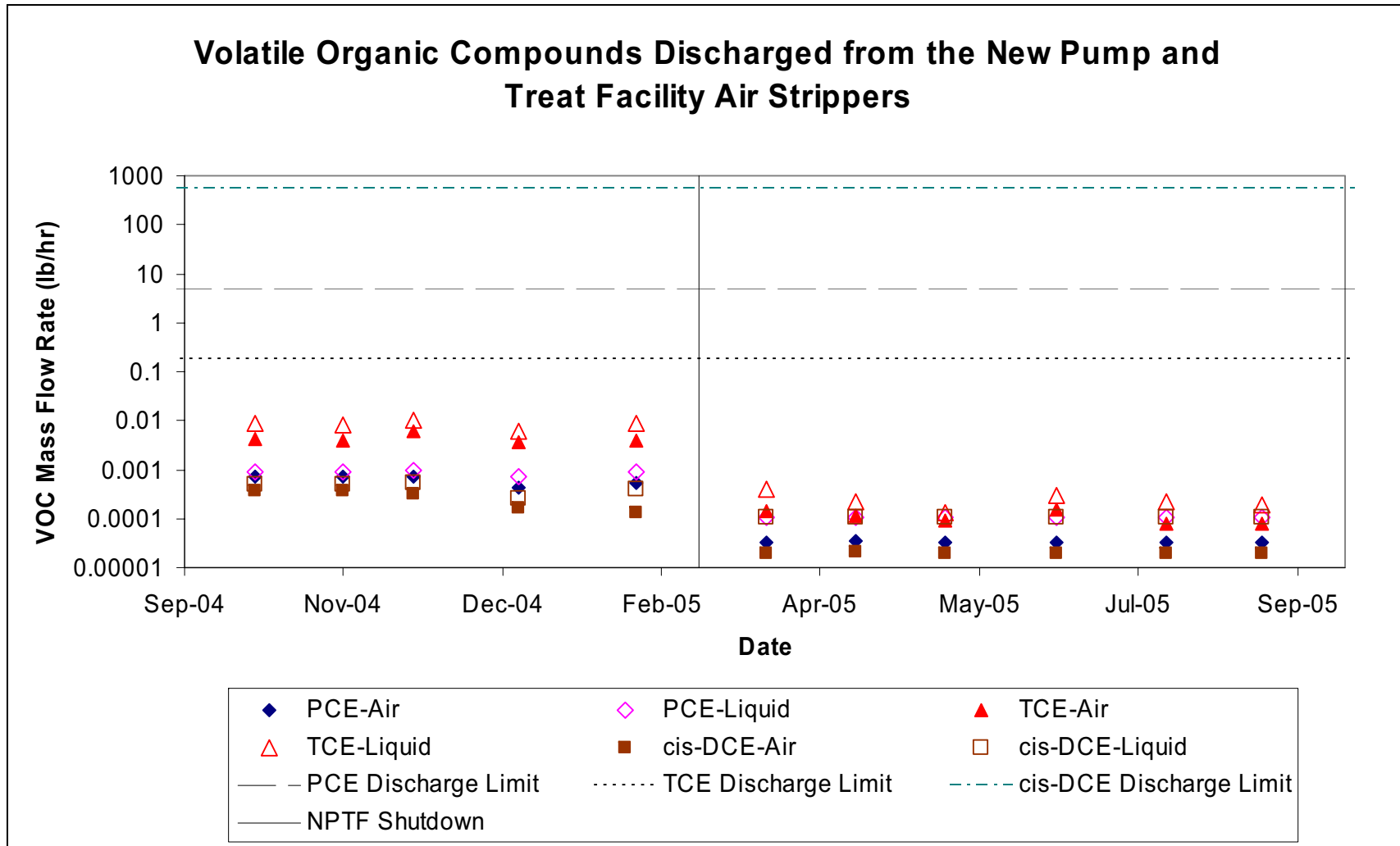


Figure 3-2. Mass flow rate of volatile organic compounds discharged to the atmosphere by the New Pump and Treat Facility. The black vertical line represents the date the New Pump and Treat Facility was placed on standby, March 1, 2005.

## 4. PERFORMANCE MONITORING EVALUATION

This section addresses the effectiveness of extraction wells at generating a capture zone that encompasses the medial zone, temporal trends in contaminant of concern concentrations at the upgradient end of the medial zone, and baseline facility effectiveness. Baseline facility effectiveness includes the effect of groundwater remedies on contaminant of concern concentrations throughout the medial zone.

### 4.1 Plume Capture

This subsection evaluates the width of the capture zone generated by operating the TAN-38, TAN-39, and TAN-40 extraction wells. Performance requirements—both for generating the capture zone and for conducting tests to document the width of the capture zone—are described in Subsections 4.2 and 4.2.1 of the *New Pump and Treat Facility Operations and Maintenance Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003b). As indicated in Table 2-3 of the Operations and Maintenance Plan, water level data from the TAN-19, TAN-32, TAN-33, and TAN-36 wells were evaluated to determine if sufficient drawdown continues to be achieved.

Water level data collected during planned shutdowns and subsequent startups were used to calculate the amount of drawdown at selected monitoring wells due to operating extraction wells. This analysis showed that the capture zone width met the requirement during both drawdown tests conducted during the reporting period. Wells included in this analysis (TAN-19, TAN-32, TAN-33, and TAN-36) are located near the edge of the minimum required capture zone (see Figure 4-1). The hydraulic response of these wells to changes in extraction flow rate as a result of starting extraction well pumps was interpreted to determine whether drawdown caused by operating the extraction wells occurred at these monitoring wells. Based on flow modeling conducted previously, measurable drawdown in these wells would indicate that the capture zone was at least as wide as required (INEEL 2003a, 2003b).

Results of drawdown testing are summarized in Table 4-1. Water levels responded from 0.014 to 0.05 ft (0.17 to 0.6 in.) when extraction well pumps were turned off or on. The response of water levels in these wells to extraction well shutdown indicates that extraction wells cause drawdown at these monitoring wells and, thus, the capture zone extends at least as far as these wells. Therefore, it can be concluded that the extraction wells generate a capture zone that meets the requirement that the zone extend at least 225 ft from the medial zone centerline. Unfortunately, the water level transducer in TAN-19 was not functioning properly during the November 2004 drawdown test. However, the drawdown data from TAN-33 verify that drawdown occurred as required.

Table 4-1. Drawdown measured at selected wells.

NPTF Shutdown Date (mo/day/yr) and Time	NPTF Startup Date (mo/day/yr) and Time	Drawdown Observed during Startup (ft)				Post-Startup Extraction Rate (gpm)		
		TAN- 19	TAN- 32	TAN- 33	TAN- 36	TAN- 38	TAN- 39	TAN- 40
11/30/04, 1030	11/30/04, 1339	—	0.05	0.02	0.014	0	85	82

NPTF = New Pump and Treat Facility  
TAN = Test Area North

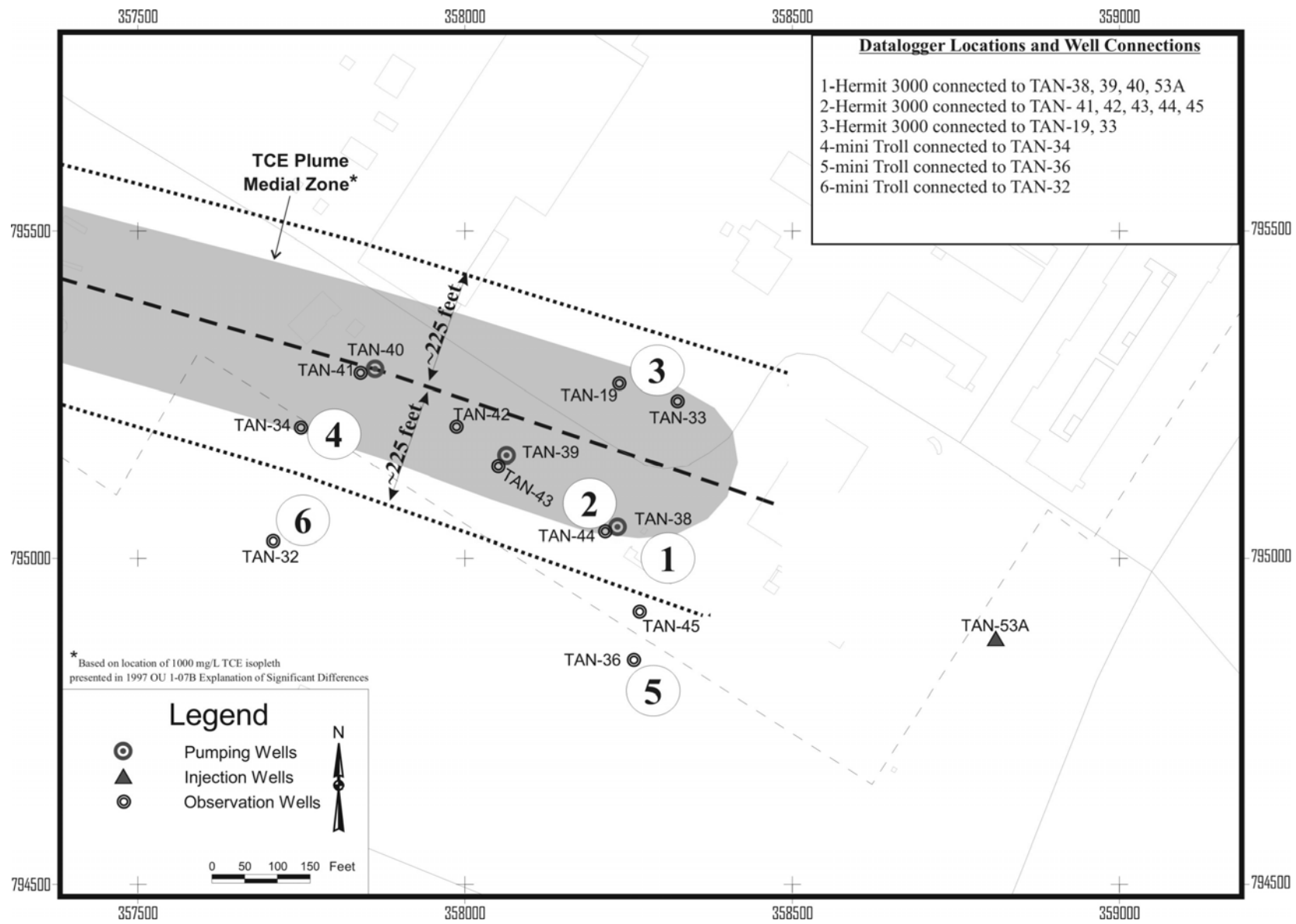


Figure 4-1. Medial zone capture zone.

## 4.2 Upgradient Source Control

Upgradient source control refers to monitoring the concentration of contaminants of concern upgradient of the extraction well network. The *New Pump and Treat Facility Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B* (DOE-ID 2003a) describes the required monitoring. The purpose of upgradient monitoring primarily is to provide a warning that groundwater with higher-than-anticipated contaminant concentrations is moving toward the extraction wells. Operational changes can then be made before this groundwater reaches the extraction well network.

The VOC and Sr-90 data for the TAN-29 well are shown in Figure 4-2 and are tabulated in Appendix D. As shown in Figure 4-2, the concentration of VOCs and Sr-90 in Well TAN-29 decreased during FY 2005. Annual sampling for Sr-90 in Well TAN-29 is required and data collected during FY 2004 were included in the plot to provide additional background information.

Based on the trends illustrated in Figure 4-2, there is no evidence that a body of water that has substantially higher contaminant concentrations than has been previously treated is moving toward the NPTF extraction wells. As a result, NPTF design limits will not be exceeded and changes in NPTF operations are not needed.

## 4.3 Medial Zone Rebound Test

The NPTF was operated continuously from October 1, 2001, until March 1, 2005, when the NPTF was placed on standby mode for the duration of the medial zone rebound test. The purpose, objectives, and design of this test are described in the *New Pump and Treat Facility Medial Zone Rebound Test Plan, Operable Unit 1-07B, Test Area North* (Wymore et al. 2004). The test will be dynamic in the sense that periodic monitoring data will be evaluated to determine when the system should resume operations. Rebound to unacceptably high concentrations before the end of the planned 24-month test will result in termination of the rebound test and restart of the NPTF. Otherwise, NPTF operations will resume on March 1, 2007.

While the rebound test is being performed, groundwater samples are collected in accordance with the *Sampling and Analysis Plan for the New Pump and Treat Facility Medial Zone Rebound Test, Operable Unit 1-07B, Test Area North* (Dettmers 2004). The wells and parameters indicated in the sampling plan were sampled at the required frequency during this reporting period. The 90% completeness goal was met for all analytes. A brief summary of the data collected in support of the medial zone rebound test is presented in Appendix D. At the conclusion of the rebound test, a summary report will be prepared to document the results of the test and to recommend any changes to the long-term NPTF operating strategy.

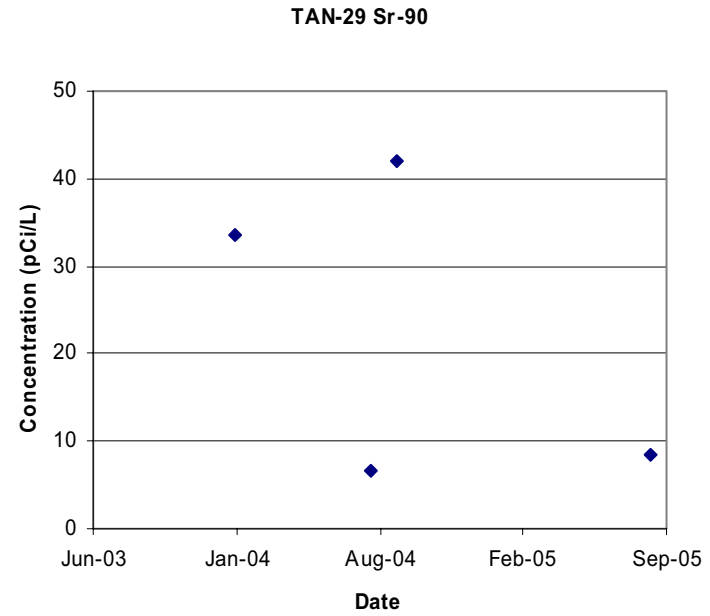
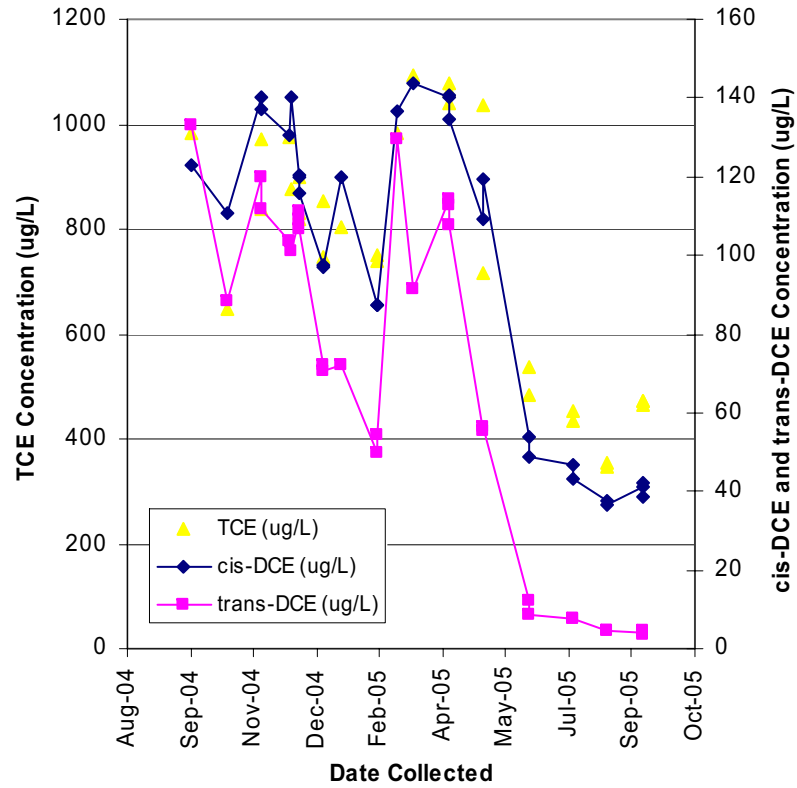


Figure 4-2. Volatile organic compounds and strontium-90 concentrations at Well TAN-29.

## 5. SUMMARY

This section summarizes the findings of previous sections of this report.

### 5.1 Operations

The following pertains to operations:

- The NPTF operated within established limits throughout FY 2005. These limits include operational uptime, extraction well flow rate, and water and air discharge limits.
- Purge water processed by the NPTF during FY 2005 was handled in accordance with established procedures.
- Routine daily inspections were performed as required with the exception of January 8, 2005, when the roads to the Site were closed as a result of winter weather conditions. On this date, personnel available at the Site looked in the facility windows to verify that there were no visible signs of leaks and that the facility was operating normally.
- The 90% completeness goal for performance sample collection and analysis was met. The 100% completeness goal for compliance sample collection was met.
- The NPTF operational uptime was 97%, which met the uptime goal of at least 90%.
- The NPTF was placed into standby mode on March 1, 2005, in support of the medial zone rebound test. A detailed description of the rebound study can be found in the *New Pump and Treat Facility Zone Rebound Test Plan, Operable Unit 1-07B, Test Area North* (Wymore et al. 2004).

### 5.2 Plume Capture

Water levels in several monitoring wells responded to extraction well startup (i.e., pumping from extraction wells caused drawdown at these monitoring wells). Drawdown observed in TAN-32, TAN-33, and TAN-36 indicates that the required plume capture width is achieved.

### 5.3 Upgradient Source Control

Concentrations of VOCs at TAN-29 decreased significantly following shutdown of the NPTF. No changes to the NPTF operating strategy are needed in response to this trend. Additionally, the concentration of Sr-90 in Well TAN-29 remained relatively constant. Based on this sample result and a comparison with historical data, there is not an increasing trend of Sr-90 in Well TAN-29 and no changes to the NPTF operating strategy are needed.





## 6. REFERENCES

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## **Appendix A**

### **Purge Water Management at the New Pump and Treat Facility, Fiscal Year 2005**



## Appendix A

### Purge Water Management at the New Pump and Treat Facility, Fiscal Year 2005

This appendix contains a summary of purge water processed through the New Pump and Treat Facility during Fiscal Year 2005. Table A-1 shows the month in which purge water was processed, the source of the purge water, the processing ratio, and the total volume of purge water processed during each month.

Table A-1. Purge water management.

Sampling Event Date (month/year)	Wells Sampled (well identifier)	Processing <sup>a</sup> Ratio	Total Volume of Purge Water (gal)
10/2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	342
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	377
11/2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1861, TAN-1860	100:1	378
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	428
12/2004	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-33, TAN-36, TAN-43, TAN-44, TAN-1860, TAN-1861	100:1	342
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	448
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	268
01/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	418
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	590
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	154
02/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	231
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	430

Sampling Event Date (month/year)	Wells Sampled (well identifier)	Processing <sup>a</sup> Ratio	Total Volume of Purge Water (gal)
03/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-33, TAN-36, TAN-43, TAN-44, TAN-1860, TAN-1861	100:1	420
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	356
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	380
04/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	378
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	267
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	180
05/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	330
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	185
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	144
06/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	360
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	148
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	260
07/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	350
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	278
	TAN-36, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	180
08/2005	TAN-16, TAN-51, TAN-52, TAN-54, TAN-55, TAN-57, TAN-21, ANP-08, TAN-36, TAN-48, TAN-33, TAN-44, TAN-43, TAN-42, TAN-41	N/A	504
	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	260
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	393

Sampling Event Date (month/year)	Wells Sampled (well identifier)	Processing <sup>a</sup> Ratio	Total Volume of Purge Water (gal)
09/2005	TAN-D2, TAN-10A, TAN-26, TAN-27, TAN-28, TAN-29, TAN-30A, TAN-1860, TAN-1861	100:1	645
	TSF-05A and B, TAN-25, TAN-31, TAN-37A, TAN-37B, TAN-37C, TAN-1859	500:1	200
	TAN-16, TAN-51, TAN-52, TAN-54, TAN-55, TAN-57, TAN-21, ANP-08, TAN-33, TAN-36, TAN-41, TAN-42, TAN-43, TAN-44	N/A	228

GWTF = Groundwater Treatment Facility

TAN = Test Area North

TSF = Technical Support Facility

a. The processing ratio is defined as the flow rate of the facility divided by the flow rate of the purge water being processed. Wells located outside of the hotspot area do not have a required processing ratio, and the ratio is indicated as N/A in the table.





## **Appendix B**

### **Summary of Fiscal Year 2005 New Pump and Treat Facility Operations**



## Appendix B

### Summary of Fiscal Year 2005 New Pump and Treat Facility Operations

The New Pump and Treat Facility (NPTF) operated continuously throughout the reporting period. Table B-1 contains a summary of all shutdowns, including any corrective actions taken and the amount of downtime caused by each shutdown. No entries are made in Table B-1 after March 1, 2005, when the NPTF was placed into standby in support of the medial zone rebound test. While on standby mode, the NPTF was operated for approximately one week each month to process purge water generated during OU 1-07B sampling activities. During purge water processing, the NPTF was operated using potable water at a flow rate of approximately 200 gallons per minute.

Table B-1. Summary of New Pump and Treat Facility shutdowns during Fiscal Year 2005.

Date (month/day/year)	Issue	Corrective Action	Downtime (hours)
11/18/04	The facility was shut down in support of a planned TAN area power outage.	The facility was placed back into operation once the power came back on.	0.3
12/22/04	The facility was placed on stand-by to power wash the air stripper trays and also placed on standby for the duration of the holiday work curtailment.	The facility was placed back into operation on January 3, 2005, when the holiday work curtailment was over.	298
01/13/05	The facility shut down as a result of a high water level alarm (LT-307) in the surge tank that was caused by foaming while processing purge water.	The facility was placed back into operation once the foaming dissipated.	1
02/22/05	The facility shut down as a result of a high water level alarm (LT-307) that was caused by foaming in the surge tank while processing purge water. Purge water that contains whey has a tendency to foam while being processed through the NPTF.	The facility was placed back into operation once the foaming dissipated. Also, the purge water processing procedure was modified to allow manual operations when the facility is manned.	2

Table B-1. (continued).

Date (month/day/year)	Issue	Corrective Action	Downtime (hours)
03/1/05	The facility was placed into standby operations in support of the medial zone rebound test.	The facility will be placed back into operation once the medial zone rebound test is complete.	On-going
		Total Hours Down Time	301.3
		Total Hours in Year (FY 2005)	3,551
		Calculated Uptime %	91.5% (FY 2005) 96.1% (12-mo)

TAN = Test Area North

## **Appendix C**

### **Water Quality Data for New Pump and Treat Facility Influent, Effluent, and Air Emissions, Fiscal Year 2005**



## **Appendix C**

### **Water Quality Data for New Pump and Treat Facility Influent, Effluent, and Air Emissions, Fiscal Year 2005**

Volatile organic compound and radionuclide concentrations measured in samples collected from the New Pump and Treat Facility influent sampling point (SP-1) and effluent sampling points (SP-2, SP-3, and SP-4) are tabulated in Tables C-1 through C-9. Results of air and liquid effluent rates from the NPTF are shown in Table C-10.

Table C-1. New Pump and Treat Facility volatile organic compound influent data (SP-1 prior to 03/01/05, SP-5 after 03/01/05).

Sample Identifier	Date (mo/day/yr)	Time	PCE		TCE		<i>trans</i> -DCE		<i>cis</i> -DCE		VC	
			(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag
NPT17601VA	10/12/04	1600	1	U	1	U	1	U	1	U	1	U
NPT17701VA	10/12/04	1430	1	U	1	U	1	U	1	U	1	U
NPT18301VA	11/09/04	1100	1	U	1	U	1	U	1	U	1	U
NPT18201VA	11/09/04	1100	1	U	1	U	1	U	1	U	1	U
NPT18901VA	12/01/04	1130	1	U	1	U	1	U	1	U	1	U
NPT18801VA	12/01/04	1300	1	U	1	U	1	U	1	U	1	U
NPT19501VA	01/03/05	1900	1	U	1	U	1	U	1	U	1	U
				J		J		J		J		J
NPT19401VA	01/03/05	1030	1	U	1	U	1	U	1	U	1	U
NPT20001VA	02/09/05	0915	1	R	1.2	R	1	R	1	R	1	R
NPT20101VA	02/09/05	0915	1	R	2.2	R	1	R	1	R	1	R
NPT20601VA	03/22/05	1300	1	U	1	U	1	U	1	U	1	U
NPT20701VA	03/22/05	1015	1	U	1	U	1	U	1	U	1	U
NPT21201VA	04/19/05	1300	1	U	1	U	1	U	1	U	1	U
NPT21301VA	04/19/05	1115	1	U	1	U	1	U	1	U	1	U
NPT21801VA	05/17/05	1330	1	U	1	U	1	U	1	U	1	U
NPT20901VA	05/17/05	1115	1	U	1	U	1	U	1	U	1	U
NPT22401VA	06/21/05	1330	1	U	1.2	U	1	U	1	U	1	U
NPT22501VA	06/21/05	1130	1	U	1.3	U	1	U	1	U	1	U
NPT23001VA	07/26/05	1230	1	U	1.3	U	1	U	1	U	1	U
NPT23101VA	07/26/05	1030	1	U	1.3	U	1	U	1	U	1	U
NPT23601VA	08/25/05	1230	1	U	1	U	1	U	1	U	1	U
NPT23710VA	08/25/05	1030	1	U	1	U	1	U	1	U	1	U

DCE = dichloroethene      D = diluted sample  
PCE = tetrachloroethene      J = estimated value  
TCE = trichloroethene      U = nondetect (half the detection limit is graphed)  
VC = vinyl chloride      R = rejected (hold-time exceeded by off-Site laboratory)

C-4



Table C-2. New Pump and Treat Facility tritium influent data (SP-1 before 03/01/05, SP-5 after 03/01/05).

Sample Identifier	Date (mo/day/yr)	Time	H-3			
			(pCi/L)	Flag	+/-	Minimum Detectable Activity
NPT17201R8	10/12/04	1430	1630		104	270
NPT17801R8	11/09/04	1100	1870		123	328
NPT18401R8	12/01/04	1130	1930		118	304
NPT18402R8	12/01/04	1130	1770		118	310
NPT19001R8	01/03/05	1900	1660		142	316
NPT19002R8	01/03/05	1900	1390		136	319
NPT19601R8	02/09/05	0915	1790		122	319
NPT19602R8	02/09/05	0915	1680		119	314
NPT20201R8	03/22/05	1015	3.96	U	88.2	299
NPT20801R8	04/19/05	1115	129	U	94	310
NPT20802R8	04/19/05	1115	122	U	92	310
NPT21401R8	05/17/05	1115	120	U	110	180
NPT22101R8	06/21/05	1130	-86		63	250
NPT22701R8	07/26/05	1030	101	U	93	350
NPT22702R8	07/26/05	1030	-0.7	U	0	350
NPT23201R8	08/25/05	1030	-60		110	210

Table C-3. New Pump and Treat Facility strontium-90 influent data (SP-1 before 03/01/05, SP-5 after 03/01/05).

Sample Identifier	Date (mo/day/yr)	Time	Sr-90			
			(pCi/L)	Flag	+/-	Minimum Detectable Activity
NPT17201RB	10/12/04	1430	0.192	U	0.148	0.636
NPT17801RB	11/09/04	1100	0.0487	U	0.122	0.540
NPT18401RB	12/01/04	1130	0.0997	U	0.164	0.762
NPT18402RB	12/01/04	1130	0.0907	U	0.164	0.761
NPT19001RB	01/03/05	1900	-0.327	U	0.118	0.589
NPT19002RB	01/03/05	1900	0.0311	U	0.127	0.559
NPT19601R8	02/09/05	0915	0.0337	U	0.058	0.195
NPT19602R8	02/09/05	0915	-0.193	U	0.119	0.615
NPT20201RB	03/22/05	1015	2.33	—	0.416	1.23
NPT20801RB	04/19/05	1115	1.20	—	0.21	0.60
NPT20802RB	04/19/05	1115	1.17	—	0.21	0.60
NPT21401RB	05/17/05	1115	2.96	—	0.31	0.73
NPT22101RB	06/21/05	1130	0.53	—	0.20	0.65
NPT22701RB	07/26/05	1030	4.02	—	0.76	0.83
NPT22702RB	07/26/05	1030	4.15	—	0.72	0.72
NPT23201RB	08/25/05	1030	2.40	—	0.18	0.37

J = estimated value  
 U = nondetect

Table C-4. New Pump and Treat Facility gross alpha influent (SP-1) and effluent (SP-2 before 03/01/05, SP-5 after 03/01/05) data.

Sample Identifier	Sample Collection Date (mo/day/yr)	Sample Collection Time	Sample Location	Alpha Count Date (mo/day/yr)	Background Counts	Source Count (cpm)	Source Activity	Sample Count	Background Count Rate (cpm)	Source Count Rate (cpm)	Sample Count Rate (cpm)	Net Count Rate (cpm)	Counting Efficiency (cpm/dpm)	Total Disintegrations Rate (dpm)	Sample Activity (pCi)	Gross Alpha (pCi/L)
NPT17201AB	10/12/04	1430	SP-1	10/18/04	11	249231	17180	34	0.22	4984.62	0.68	0.46	0.29	1.59	0.71	23.83 ± 13.62
NPT17301AB	10/12/04	1430	SP-2	10/18/04	11	249231	17180	13	0.22	4984.62	0.26	0.04	0.29	0.14	0.06	2.07 ± 9.95
NPT17302AB	10/12/04	1430	SP-2	10/18/04	11	249231	17180	11	0.22	4984.62	0.22	0	0.29	0.00	0.00	0.00 ± 9.53
NPT17801AB	11/09/04	1100	SP-1	11/15/04	5	251308	17180	28	0.1	5026.16	0.56	0.46	0.29	1.57	0.71	23.63 ± 11.57
NPT17901AB	11/09/04	1100	SP-2	11/15/04	5	251308	17180	14	0.1	5026.16	0.28	0.18	0.29	0.62	0.28	9.25 ± 8.78
NPT17902AB	11/09/04	1100	SP-2	11/15/04	5	251308	17180	14	0.1	5026.16	0.28	0.18	0.29	0.62	0.28	9.25 ± 8.78
NPT18401AB	12/01/04	1130	SP-1	12/08/04	4	248266	17180	34	0.08	4965.32	0.68	0.6	0.29	2.08	0.94	31.20 ± 12.57
NPT18402AB	12/01/04	1130	SP-1	12/08/04	4	248266	17180	12	0.08	4965.32	0.24	0.16	0.29	0.55	0.25	8.32 ± 8.15
NPT18501AB	12/01/04	1130	SP-2	12/08/04	4	248266	17180	12	0.08	4965.32	0.24	0.16	0.29	0.55	0.25	8.32 ± 8.15
NPT19001AB	01/03/05	1900	SP-1	01/13/05	22	255529	17180	11	0.44	5110.58	0.22	-0.22	0.30	-0.74	-0.33	-11.12 ± 11.38
NPT19002AB	01/03/05	1900	SP-1	01/13/05	22	255529	17180	36	0.44	5110.58	0.72	0.28	0.30	0.94	0.42	14.15 ± 15.09
NPT19101AB	01/03/05	1900	SP-2	01/13/05	22	255529	17180	24	0.44	5110.58	0.48	0.04	0.30	0.13	0.06	2.02 ± 13.43
NPT19601AB	02/09/05	0915	SP-1	02/14/05	8	250151	17180	12	0.16	5003.02	0.24	0.08	0.29	0.27	0.12	4.13 ± 9.05
NPT19602AB	02/09/05	0915	SP-1	02/14/05	8	250151	17180	3	0.16	5003.02	0.06	-0.1	0.29	-0.34	-0.15	-5.16 ± 6.71
NPT19701AB	02/09/05	0915	SP-2	02/14/05	8	250151	17180	3	0.16	5003.02	0.06	-0.1	0.29	-0.34	-0.15	-5.16 ± 6.71
NPT20201AB	03/22/05	1015	SP-5	03/28/05	13	252288	17180	7	0.26	5045.76	0.14	-0.12	0.29	-0.41	-0.18	-6.14 ± 8.97
NPT20301AB	03/22/05	1015	SP-2	03/28/05	13	252288	17180	13	0.26	5045.76	0.26	0	0.29	0.00	0.00	0.00 ± 10.23
NPT20302AB	03/22/05	1015	SP-2	03/28/05	13	252288	17180	10	0.26	5045.76	0.2	-0.06	0.29	-0.20	-0.09	-3.07 ± 9.62
NPT20801AB	04/19/05	1115	SP-5	04/25/05	4	251545	17180	17	0.08	5030.9	0.34	0.26	0.29	0.89	0.40	13.34 ± 9.22
NPT20802AB	04/19/05	1115	SP-5	04/25/05	4	251545	17180	7	0.08	5030.9	0.14	0.06	0.29	0.20	0.09	3.08 ± 6.67
NPT20901AB	04/19/05	1115	SP-2	04/25/05	4	251545	17180	3	0.08	5030.9	0.06	-0.02	0.29	-0.07	-0.03	-1.03 ± 5.32
NPT21401AB	05/17/05	1115	SP-5	06/15/05	6	257871	17180	12	0.12	5157.42	0.24	0.12	0.30	0.40	0.18	6.01 ± 8.33
NPT21501AB	05/17/05	1115	SP-2	06/15/05	6	257871	17180	35	0.12	5157.42	0.70	0.58	0.30	1.93	0.87	29.04 ± 12.57
NPT21502AB	05/17/05	1115	SP-2	06/15/05	6	257871	17180	10	0.12	5157.42	0.20	0.08	0.30	0.27	0.12	4.01 ± 7.85
NPT22001AB	06/21/05	1130	SP-2	07/19/05	3	248873	17180	12	0.06	4977.46	0.24	0.18	0.29	0.62	0.28	9.34 ± 7.88
NPT22002AB	06/21/05	1130	SP-2	07/19/05	3	278873	17180	6	0.06	5577.46	0.12	0.06	0.32	0.18	0.08	2.78 ± 5.44
NPT22101AB	06/21/05	1130	SP-5	07/19/05	3	248873	17180	7	0.06	4977.46	0.14	0.08	0.29	0.28	0.12	4.15 ± 6.43
NPT22601AB	07/26/05	1030	SP-2	08/16/05	2	250362	17180	14	0.04	5007.24	0.28	0.24	0.29	0.82	0.37	12.38 ± 8.09
NPT22701AB	07/26/05	1030	SP-5	08/16/05	2	250362	17180	27	0.04	5007.24	0.54	0.50	0.29	1.72	0.77	25.78 ± 10.89
NPT22702AB	07/26/05	1030	SP-5	08/16/05	2	250362	17180	10	0.04	5007.24	0.20	0.16	0.29	0.55	0.25	8.25 ± 7.00
NPT23201AB	08/25/05	1030	SP-5	10/18/05	12	246073	17180	8	0.24	4921.46	0.16	-0.08	0.29	-0.28	-0.13	-4.20 ± 9.20
NPT23301AB	08/25/05	1030	SP-2	10/18/05	12	246073	17180	19	0.24	4921.46	0.38	0.14	0.29	0.49	0.22	7.35 ± 11.45
NPT23302AB	08/25/05	1030	SP-2	10/18/05	12	246073	17180	8	0.24	4921.46	0.16	-0.08	0.29	-0.28	-0.13	-4.20 ± 9.20

Table C-5. New Pump and Treat Facility volatile organic compound air effluent data.

SP-3-A-311												
Sample Identifier	Date		PCE		TCE		<i>cis</i> -DCE		<i>trans</i> -DCE		VC	
	(mo/day/yr)	Time	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag
NPT17401VT	10/12/04	1430	29		210		25		7.9		3.4	U
NPT18001VT	11/09/04	1100	29		190		24		7.4		2.7	U
NPT18601VT	12/01/04	1130	28		310		22		8.1		4.3	U
NPT19201VT	01/03/05	1900	17		180		11		2.8		2.6	U
NPT19801VT	02/09/05	0915	21		190		9.1		2.5	U	2.5	U
NPT20401VT	03/22/05	1015	1.3	U	7		1.3	U	1.4	U	1.3	U
NPT21001VT	04/19/05	1115	1.4	U	5.6		1.4	U	1.4	U	1.4	U
NPT21601VT	05/17/05	1115	1.3	U	4.6		1.3	U	1.3	U	1.3	U
NPT22201VT	06/21/05	1130	1.3	U	7.3		1.3	U	1.3	U	1.3	U
NPT22801VT	07/26/05	1030	1.3	U	4.0		1.3	U	1.3	U	1.3	U
NPT23401VT	08/25/05	1030	1.3	U	3.9		1.3	U	1.4	U	1.3	U

SP-4-A-310												
Sample Identifier	Date		PCE		TCE		<i>cis</i> -DCE		<i>trans</i> -DCE		VC	
	(mo/day/yr)	Time	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag	(ppb [v/v])	Flag
NPT17501VT	10/12/04	1430	28		200		23		7.5		3.2	U
NPT18101VT	11/09/04	1100	20		130		16		4.9		1.7	U
NPT18701VT	12/01/04	1130	14		140		11		3.8		1.6	U
NPT19301VT	01/03/05	1900	11		110		6.2		1.6		1.3	U
NPT19901VT	02/09/05	0915	14		150		7.8		2.4	U	2.4	U
NPT20501VT	03/22/05	1010	1.8		4.4		1.3	U	1.4	U	1.3	U
NPT21101VT	04/19/05	1115	150		160		1.4	U	1.4	U	1.4	U
NPT21701VT	05/17/05	1115	1.4	U	2		1.4	U	1.4	U	1.4	U
NPT22301VT	06/21/05	1130	1.9		6.8		1.3	U	1.3	U	1.3	U
NPT22901VT	07/26/05	1030	110		46		1.4	U	1.4	U	1.4	U
NPT23501VT	08/25/05	1030	1.3	U	4.6		1.3	U	1.4	U	1.3	U

DCE = dichloroethene	D = diluted sample
PCE = tetrachloroethene	J = estimated value
TCE = trichloroethene	U = nondetect (half the detection limit is graphed)
VC = vinyl chloride	

Table C-6. New Pump and Treat Facility volatile organic compound water effluent data.

SP-2 Total Effluent												
Sample Identifier	Date (mo/day/yr)	Time	PCE		TCE		<i>trans</i> -DCE		<i>cis</i> -DCE		VC	
			(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag	(µg/L)	Flag
NPT17301VA	10/12/04	1430	1	U	1	U	1	U	1	U	1	U
NPT17302VA	10/12/04	1430	1	U	1	U	1	U	1	U	1	U
NPT17901VA	11/09/04	1100	1	U	1	U	1	U	1	U	1	U
NPT17902VA	11/09/04	1100	1	U	1	U	1	U	1	U	1	U
NPT18501VE	12/01/04	1130	1	U	1	U	1	U	1	U	1	U
NPT19101VE	01/03/05	1900	1	R	1	R	1	R	1	R	1	R
NPT19701VE	02/09/05	0915	1	U	1.6		1	U	1	U	1	U
NPT20301VA	03/22/05	1015	1	U	1	U	1	U	1	U	1	U
NPT20302VA	03/22/05	1015	1	U	1	U	1	U	1	U	1	U
NPT20901VE	04/19/05	1115	1	U	1	U	1	U	1	U	1	U
NPT21501VA	05/17/05	1115	1	U	1	U	1	U	1	U	1	U
NPT21502VA	05/17/05	1115	1	U	1	U	1	U	1	U	1	U
NPT22001VA	06/21/05	1130	1	U	1	U	1	U	1	U	1	U
NPT22002VA	06/21/05	1130	1	U	1	U	1	U	1	U	1	U
NPT22601VA	07/26/05	1030	1	U	1	U	1	U	1	U	1	U
NPT23301VA	08/25/05	1030	1	U	1	U	1	U	1	U	1	U
NPT23302VA	08/25/05	1030	1	U	1	U	1	U	1	U	1	U

DCE = dichloroethene    D = diluted sample  
 PCE = tetrachloroethene    J = estimated value  
 TCE = trichloroethene    U = nondetect (half the detection limit is graphed)  
 VC = vinyl chloride

Table C-7. New Pump and Treat Facility tritium effluent data.

SP-2, Total Effluent					
Sample Identifier	Date (mo/day/yr)	Time	(pCi/L)	+/-	Minimum Detectable Amount
NPT17301R8	10/12/04	1430	1820	107	272
NPT17302R8	10/12/04	1430	1970	104	257
NPT17901R8	11/09/04	1100	1840	135	370
NPT17902R8	11/09/04	1100	1660	129	357
NPT18501R8	12/01/04	1130	2080	121	307
NPT19101R8	01/03/05	1900	2180	156	322
NPT19701R8	02/09/05	0915	1970	124	317
NPT20301R8	03/22/05	1015	49.6	89.1	299
NPT20302R9	03/22/05	1015	266	93.0	299
NPT20901R8	04/19/05	1115	2	52	310
NPT21501R8	05/17/05	1115	60	110	190
NPT21502R8	05/17/05	1115	60	97	180
NPT22001R8	06/21/05	1130	-63	61	250
NPT22002R8	06/21/05	1130	-87	60	260
NPT22601R8	07/26/05	1030	-50	120	350
NPT22601R8	07/26/05	1030	210	120	360
NPT23301R8	08/25/05	1030	-60	100	210
NPT23302R8	08/25/05	1030	-100	110	210

Table C-8. New Pump and Treat Facility strontium-90 effluent data (SP-2).

SP-2, Total Effluent						
Sample Identifier	Date (mo/day/yr)	Time	(pCi/L)	Flag	+/-	Minimum Detectable Limit
NPT17301RB	10/12/04	1430	0.27	U	0.169	0.697
NPT17302RB	10/12/04	1430	0.307		0.100	0.332
NPT17901RB	11/09/04	1100	0.477	U J	0.166	0.526
NPT17902RB	11/09/04	1100	0.0532	U	0.114	0.502
NPT18501RB	12/01/04	1130	-0.178	U	0.132	0.735
NPT19101RB	01/03/05	1900	-0.0458	U	0.105	0.493
NPT19701RB	02/09/05	0915	-0.0903	U	0.097	0.492
NPT20301RB	03/22/05	1015	2.01		0.402	1.35
NPT20302RB	03/22/05	1015	2.97		0.428	1.25
NPT20901RB	04/19/05	1115	2.55		0.35	0.93
NPT21501RB	05/17/05	1115	3.54		0.35	0.78
NPT21502RB	05/17/05	1115	2.79		0.29	0.68
NPT22001RB	06/21/05	1130	1.35		0.16	0.36
NPT22002RB	06/21/05	1130	0.58		0.13	0.37
NPT22601RB	07/26/05	1030	3.95		0.77	0.85
NPT23301RB	08/25/05	1030	1.40		0.11	0.20
NPT23302RB	08/25/05	1030	1.02		0.093	0.21

J = estimated value

U = nondetect

Table C-9. New Pump and Treat Facility gross beta influent (SP-1) and effluent (SP-2) data.

Sample Identifier	Sample Collection Date (mo/day/yr)	Sample Collection Time	Beta Count Date (mo/day/yr)	Background Count	Source Count	Source Activity (dpm)	Sample Count	Background Count Rate (cpm)	Source Count Rate (cpm)	Sample Count Rate (cpm)	Net Count Rate (cpm)	Counting Efficiency (cpm/dpm)	Total Disintegrations Rate (dpm)	Sample Activity (pCi)	Sample Count Rate Uncertainty (cpm)	Sample Concentration (pCi/L)
NPT17201AB	10/12/04	1430	10/18/04	1690	106238	10917	1630	33.8	2124.76	32.6	-1.2	0.19	-6.27	-2.83	2.26	-94.17 ± 177.24
NPT17301AB	10/12/04	1430	10/18/04	1690	106238	10917	1621	33.8	2124.76	32.42	-1.38	0.19	-7.21	-3.25	2.26	-108.29 ± 177.00
NPT17302AB	10/12/04	1430	10/18/04	1690	106238	10917	1649	33.8	2124.76	32.98	-0.82	0.19	-4.28	-1.93	2.27	-64.35 ± 177.75
NPT17801AB	11/09/04	1100	11/15/04	1516	106441	10917	1578	30.32	2128.82	31.56	1.24	0.19	6.45	2.91	2.18	96.96 ± 170.49
NPT17901AB	11/09/04	1100	11/15/04	1516	106441	10917	1486	30.32	2128.82	29.72	-0.6	0.19	-3.12	-1.41	2.15	-46.91 ± 167.94
NPT17902AB	11/09/04	1100	11/15/04	1516	106441	10917	1576	30.32	2128.82	31.52	1.2	0.19	6.24	2.81	2.18	93.83 ± 170.44
NPT18401AB	12/01/04	1130	12/08/04	1647	106943	10917	1680	32.94	2138.86	33.6	0.66	0.19	3.42	1.54	2.26	51.42 ± 176.17
NPT18402AB	12/01/04	1130	12/08/04	1647	106943	10917	1645	32.94	2138.86	32.9	-0.04	0.19	-0.21	-0.09	2.25	-3.12 ± 175.24
NPT18501AB	12/01/04	1130	12/08/04	1647	106943	10917	1647	32.94	2138.86	32.94	0	0.19	0.00	0.00	2.25	0.00 ± 175.29
NPT19001AB	01/03/05	1900	01/13/05	1630	106691	10917	1626	32.6	2133.82	32.52	-0.08	0.19	-0.42	-0.19	2.24	-6.25 ± 174.67
NPT19002AB	01/03/05	1900	01/13/05	1630	106691	10917	1607	32.6	2133.82	32.14	-0.46	0.19	-2.39	-1.08	2.23	-35.92 ± 174.16
NPT19101AB	01/03/05	1900	01/13/05	1630	106691	10917	1584	32.6	2133.82	31.68	-0.92	0.19	-4.78	-2.16	2.22	-71.84 ± 173.54
NPT19601AB	02/09/05	0915	02/14/05	1585	105033	10917	1605	31.7	2100.66	32.1	0.4	0.19	2.11	0.95	2.21	31.72 ± 175.59
NPT19602AB	02/09/05	0915	02/14/05	1585	105033	10917	1554	31.7	2100.66	31.08	-0.62	0.19	-3.27	-1.48	2.20	-49.17 ± 174.18
NPT19701AB	02/09/05	0915	02/14/05	1585	105033	10917	1604	31.7	2100.66	32.08	0.38	0.19	2.01	0.90	2.21	30.14 ± 175.56
NPT20201AB	03/22/05	1015	03/28/05	1659	106242	10917	1646	33.18	2124.84	32.92	-0.26	0.19	-1.36	-0.61	2.25	-20.40 ± 176.78
NPT20301AB	03/22/05	1015	03/28/05	1659	106242	10917	1612	33.18	2124.84	32.24	-0.94	0.19	-4.91	-2.21	2.24	-73.74 ± 175.87
NPT20302AB	03/22/05	1015	03/28/05	1659	106242	10917	1615	33.18	2124.84	32.3	-0.88	0.19	-4.59	-2.07	2.24	-69.03 ± 175.95
NPT20801AB	04/19/05	1115	04/25/05	1586	105389	10917	1623	31.72	2107.78	32.46	0.74	0.19	3.89	1.75	2.22	58.49 ± 175.51
NPT20802AB	04/19/05	1115	04/25/05	1586	105389	10917	1583	31.72	2107.78	31.66	-0.06	0.19	-0.32	-0.14	2.21	-4.74 ± 174.41
NPT20901AB	04/19/05	1115	04/25/05	1586	105389	10917	1647	31.72	2107.78	32.94	1.22	0.19	6.42	2.89	2.23	96.42 ± 176.16
NPT21401AB	05/17/05	1115	06/15/05	1618	105498	10917	1541	32.36	2109.96	30.82	-1.54	0.19	-8.09	-3.65	2.20	-121.62 ± 174.00
NPT21501AB	05/17/05	1115	06/15/05	1618	105498	10917	1540	32.36	2109.96	30.8	-1.56	0.19	-8.20	-3.70	2.20	-123.20 ± 173.98
NPT21502AB	05/17/05	1115	06/15/05	1618	105498	10917	1667	32.36	2109.96	33.34	0.98	0.19	5.15	2.32	2.25	77.40 ± 177.44
NPT22001AB	06/21/05	1130	07/19/05	1559	105018	10917	1580	31.18	2100.36	31.6	0.42	0.19	2.22	1.00	2.20	33.31 ± 174.16
NPT22002AB	06/21/05	1130	07/19/05	1559	105018	10917	1518	31.18	2100.36	30.36	-0.82	0.19	-4.33	-1.95	2.17	-65.02 ± 172.43
NPT22101AB	06/21/05	1130	07/19/05	1559	105018	10917	1629	31.18	2100.36	32.58	1.40	0.19	7.39	3.33	2.21	111.02 ± 175.51
NPT22601AB	07/26/05	1030	08/16/05	1555	104844	10917	1539	31.1	2096.88	30.78	-0.32	0.19	-1.69	-0.76	2.18	-25.42 ± 173.19
NPT22701AB	07/26/05	1030	08/16/05	1555	104844	10917	1539	31.1	2096.88	30.78	-0.32	0.19	-1.69	-0.76	2.18	-25.42 ± 173.19
NPT22702AB	07/26/05	1030	08/16/05	1555	104844	10917	1762	31.1	2096.88	35.24	4.14	0.19	21.88	9.87	2.26	328.84 ± 179.32
NPT23201AB	08/25/05	1030	10/18/05	1597	104176	10917	1584	31.94	2083.52	31.68	-0.26	0.19	-1.38	-0.62	2.21	-20.79 ± 176.82
NPT23301AB	08/25/05	1030	10/18/05	1597	104176	10917	1669	31.94	2083.52	33.38	1.44	0.19	7.66	3.46	2.24	115.17 ± 179.17
NPT23302AB	08/25/05	1030	10/18/05	1597	104176	10917	1570	31.94	2083.52	31.4	-0.54	0.19	-2.87	-1.30	2.21	-43.19 ± 176.43

cpm = counts per minute  
dpm = disintegrations per minute



Table C-10. Results of liquid and air effluent rates from the New Pump and Treat Facility.

Date (mo/day/yr)	Calculated PCE-Air (lb/hr)	Calculated PCE-Liquid (lb/hr)	Calculated TCE-Air (lb/hr)	Calculated TCE-Liquid (lb/hr)	Calculated cis-DCE-Air (lb/hr)	Calculated cis-DCE-Liquid (lb/hr)	Calculated trans-DCE-Air (lb/hr)	Calculated trans-DCE-Liquid (lb/hr)
10/12/04	0.000743	0.000894	0.004262	0.008945	0.000374	0.000492	0.000118	0.000201
11/09/04	0.000743	0.000919	0.003856	0.008104	0.000359	0.000485	0.000111	0.000167
12/01/04	0.000717	0.000961	0.006292	0.010025	0.000329	0.000531	0.000121	0.000246
01/03/05	0.000435	0.000714	0.003653	0.006146	0.000165	0.000265	4.19E-05	9.45E-05
02/09/05	0.000538	0.000908	0.003856	0.008699	0.000136	0.000397	3.74E-05	0.000132
03/22/05	3.33E-05	0.000103	0.000142	0.00041	1.95E-05	0.000103	2.1E-05	0.000103
04/19/05	3.59E-05	0.000103	0.000114	0.000215	2.1E-05	0.000103	2.1E-05	0.000103
05/17/05	3.33E-05	0.000103	9.34E-05	0.000133	1.95E-05	0.000103	1.95E-05	0.000103
06/21/05	3.33E-05	0.000103	0.000148	0.000287	1.95E-05	0.000103	1.95E-05	0.000103
07/26/05	3.33E-05	0.000103	8.12E-05	0.00022	1.95E-05	0.000103	1.95E-05	0.000103
08/25/05	3.33E-05	0.000103	7.92E-05	0.000185	1.95E-05	0.000103	2.1E-05	0.000103

DCE = dichloroethene  
PCE = tetrachloroethene  
TCE = trichloroethene



## **Appendix D**

### **Medial Zone Rebound Test Data Summary**



## Appendix D

### Medial Zone Rebound Test Data Summary

#### Completed Sampling Events

- Sampling for the New Pump and Treat Facility (NPTF) Rebound Test is conducted as part of four monitoring phases: Baseline, Initial Rebound, Transition, and Equilibrium. Baseline sampling events were completed on December 6, 8, and 14–15, 2004. Initial Rebound sampling events were completed from March 2, 2005 through September 13, 2005.
- The NPTF was shutdown during Idaho National Laboratory (INL) curtailment from December 20, 2004, through January 3, 2005. Sampling was conducted on January 3, 2005, prior to NPTF restart.
- The NPTF was placed into standby mode on March 1, 2005, to begin the medial zone rebound test.
- The test has been divided into three phases. The Initial Rebound Phase was completed September 13, 2005. Sampling was performed on Day 1 (March 2, 2005), Week 2 (March 16, 2005), Month 1 (April 13, 2005), Month 2 (May 16, 2005), Month 3 (June 15, 2005), Month 4 (July 20, 2005), Month 5 (August 17, 2005), and Month 6 (September 13, 2005) after shutdown.
- The concentration of Sr-90 was monitored in Well TAN-41 on September 13, 2005.

#### Upcoming Events

The Transition Phase will begin in November 2005. Sampling is scheduled to take place every two months:

- Month 8 (November 16, 2005)
- Month 10 (January 18, 2006)
- Month 12 (March 15, 2006).

The equilibrium phase will begin in June 2006. Sampling during this final phase is schedule to take place every three months and will last for one year:

- Month 15 (June 15, 2006)
- Month 18 (September 15, 2006)
- Month 21 (December 15, 2006)
- Month 24 (on or near NPTF re-start)

#### TCE Rebound Assessment

- Trichloroethene (TCE) threshold restart criteria were established in the NPTF Rebound Test Plan for Wells TAN-44, TAN-33, and TAN-36 located on the downgradient edge of the medial zone

(Figure D-1). Data collected through Month 6 indicate that TCE concentrations at these locations remain below the restart criteria (Figures D-2 and D-3; Tables D-1 and D-2).

- TCE concentrations are generally increasing; however, no significant TCE rebound has occurred at any of the wells.

Radionuclide Migration Assessment

- Based on the concentration of Sr-90 observed in Well TAN-29 and TAN-41, there do not appear to be any increasing trends of Sr-90 in the medial zone of the contaminant plume (Table D-3).

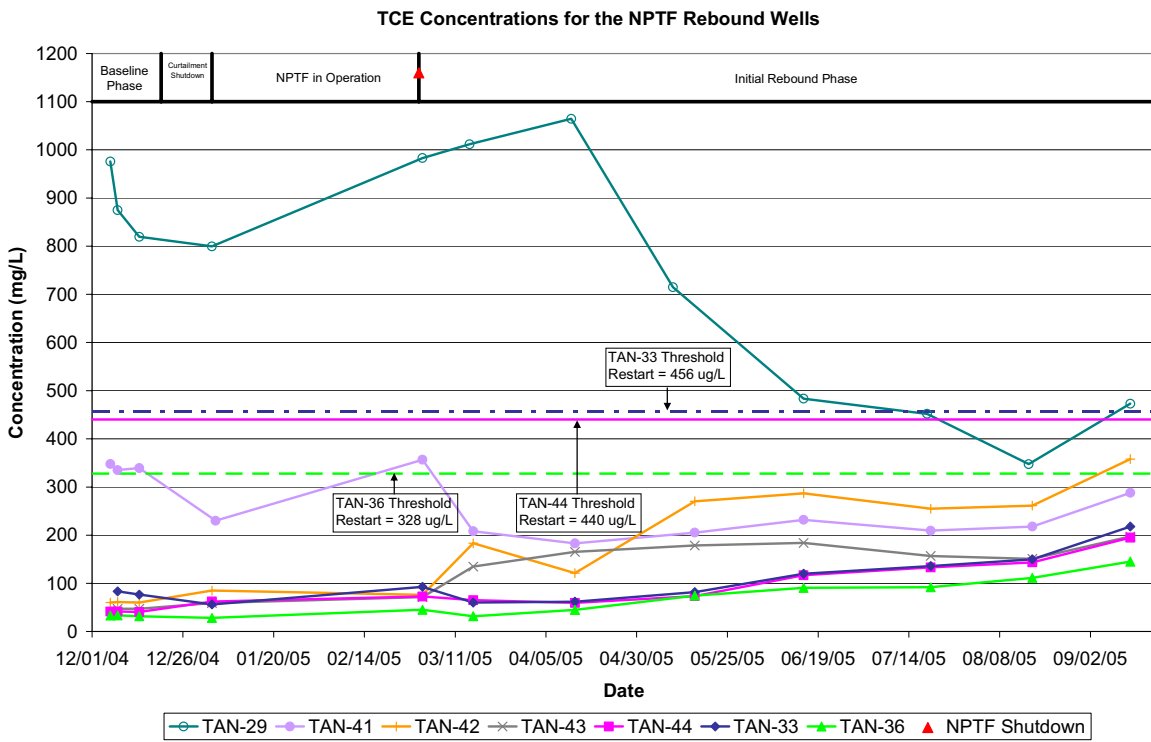


Figure D-1. Trichloroethene concentrations for all medial zone rebound test wells.

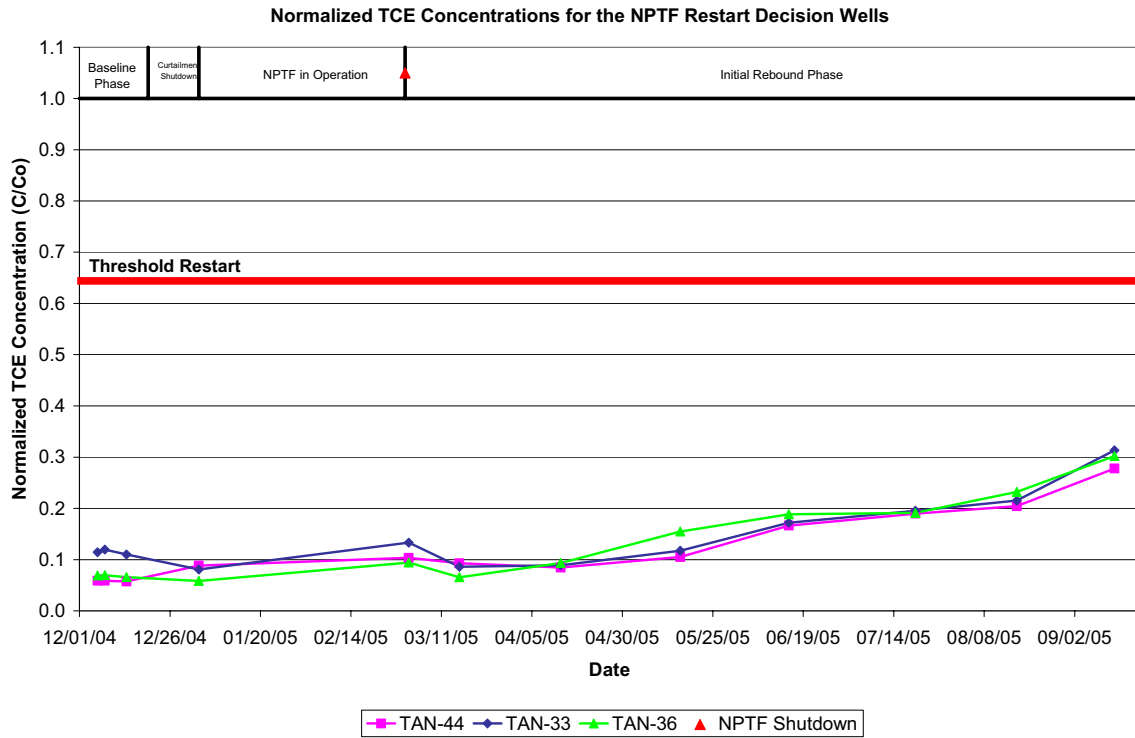


Figure D-2. Normalized trichloroethene concentrations for TAN-44, TAN-33, and TAN-36.

Table D-1. Trichloroethene concentrations compared to the threshold restart criteria (where applicable) and baseline phase average.

Well	Location	Pre-NPTF Operations Average, C <sub>o</sub> (µg/L)	Threshold Restart Criteria (µg/L)	Baseline Phase Average (µg/L)	Initial Phase Day 1 (µg/L)	Initial Phase Week 2 (µg/L)	Initial Phase Month 1 (µg/L)	Initial Phase Month 2 (µg/L)	Initial Phase Month 3 (µg/L)	Initial Phase Month 4 (µg/L)	Initial Phase Month 5 (µg/L)	Initial Phase Month 6 (µg/L)
TAN-33	Transverse	696	456	79.8	92.6	59.9	61.9	81.6	119.7	136.0	149.9	218.0
TAN-36	Transverse	480	328	32.7	45.2	31.5	44.8	74.3	90.5	91.8	111.4	145.0
TAN-44	Axial	702	440	40.9	72.6	65.1	59.2	73.6	116.7	133.2	143.4	194.9
TAN-41	Axial	NA	NA	340.8	356.7	208.0	183.0	205.2	231.8	209.6	217.7	287.9
TAN-42	Axial	NA	NA	60.2	75.9	183.3	121.0	270.2	286.8	254.6	261.3	357.9
TAN-43	Axial	NA	NA	49.7	71.2	134.5	165.1	178.3	183.9	156.8	150.7	197.2
TAN-29	Upgradient	NA	NA	890.1	983.2	1011.8	1064.5	714.8	483.4	451.9	347.5	472.9
NA = not applicable NPTF = New Pump and Treat Facility												



Table D-2. Volatile organic compound concentrations in Wells TAN-29, TAN-33, TAN-36, TAN-43, and TAN-44.

Well	Date Collected (mo/day/yr)	cis-DCE (µg/L)	PCE (µg/L)	trans-DCE (µg/L)	TCE (µg/L)	VC (µg/L)
TAN-29	10/18/04	110.7	<10	88.4	647.1	3.5
	11/15/04	140	13	120	840	3
	11/15/04	136.9	11	111.7	969.8	4.6
	12/06/04	130.3	11.9	103.4	975.9	<10
	12/08/04	140.1	11.6	100.9	875	<10
	12/14/04	120	7.4	109.1	900.5	4.6
	12/14/04	120.3	7.9	111	819.4	<10
	12/14/04	115.6	10.8	106.6	832.2	<10
	01/03/05	97.7	15.2	72.2	747.1	2
	01/03/05	97.2	15.7	70.6	852.2	1.9
	01/17/05	120	7.9	72.1	804.6	<10
	02/14/05	87.2	19.5	49.9	749.4	3.8
	02/14/05	87.4	20.5	54.4	737.5	4
	03/02/05	136.8	12.4	129.7	983.2	5.6
	03/15/05	143.5	16.1	91.4	1093.2	3.5
	04/12/05	140.2	14.6	114.2	1038.2	3.8
	04/12/05	140.8	12.3	112.6	1076.4	3.7
	04/12/05	134.7	14	107.5	1064.5	<10
	05/10/05	109.3	6.3	55.1	714.8	5.4
	05/10/05	119.5	11.6	56.5	1035.0	2.2
	06/15/05	53.7	11.8	12.2	482.8	ND
	06/15/05	48.8	13.4	8.6	537.4	ND
	06/15/05	59	28	17	470	10
	07/19/05	46.6	18.6	7.8	433.9	ND
	07/19/05	43.4	17.1	7.7	451.9	ND
	08/16/05	37.5	20.7	4.8	347.5	ND
	08/16/05	36.7	22.1	4.4	355.9	ND
	09/13/05	41.3	13.9	4.3	471.9	ND
	09/13/05	38.4	12.5	3.4	473.9	ND
	09/13/05	42.0	12.1	4.4	466.4	ND
TAN-33	12/06/04	<10	6.9	<10	79.7	ND
	12/08/04	<10	6.8	<10	83.2	ND
	12/14/04	<10	8.3			
	01/03/05	<10	7.3	<10	56.1	ND
	03/02/05	<10	12.2	<10	92.6	ND
	04/13/05	<10	9.5	<10	61.9	ND
	05/16/05	<10	4.3	<10	86.0	ND
	05/16/05	<10	3.5	<10	77.2	ND

Table D-2. (continued).

Well	Date Collected (mo/day/yr)	cis-DCE (µg/L)	PCE (µg/L)	trans-DCE (µg/L)	TCE (µg/L)	VC (µg/L)
TAN-36	06/15/05	<10	6.7	<10	119.7	ND
	07/20/05	<10	13.7	<10	136.0	ND
	08/17/05	<10	14.8	<10	149.9	ND
	09/13/05	<10	7.6	<10	218.0	ND
	12/06/04	<10	<10	<10	33.1	ND
	12/08/04	<10	<10	<10	33.5	<10
	12/14/04	<10	<10	<10	31.6	<10
	01/03/05	<10	4	<10	28.1	ND
	03/02/05	<10	3.9	<10	45.2	ND
	04/13/05	<10	4.3	<10	44.8	ND
	05/16/05	<10	<10	<10	74.3	ND
	06/15/05	<10	<10	<10	90.5	ND
	07/20/05	<10	5.8	<10	91.8	ND
	08/17/05	<10	11.0	<10	111.4	ND
TAN-43	09/13/05	<10	<10	<10	145.0	ND
	09/13/05	<10	<10	<10	45.7	ND
	12/06/04	<10	4	<10	44	ND
	12/08/04	<10	<10	<10	47	ND
	12/08/04	<10	5	<10	47	ND
	12/14/04	<10	6.3	<10	59	ND
	01/03/05	51.2	44.1	46.6	118.2	40.8
	03/02/05	<10	6.5	<10	71.2	ND
	03/02/05	49.9	42.9	45.6	115.9	34.7
	03/02/05	3.5	15.6	<10	165.1	ND
	04/13/05	<10	6.3	<10	178.3	ND
	05/16/05	<10	6.7	<10	185.3	ND
	06/15/05	<10	6.6	<10	182.5	ND
	06/15/05	2.9	10.9	<10	156.8	ND
TAN-44	07/20/05	3.0	13.7	<10	150.7	ND
	08/17/05	2.3	5.0	<10	197.2	ND
	12/06/04	<10	<10	<10	41.3	ND
	12/06/04	<10	3.7	<10	41.5	ND
	12/08/04	<10	3.7	<10	41.3	ND
	12/14/04	<10	<10	<10	40.2	<10
	01/03/05	<10	6.7	<10	62	ND
	03/02/05	<10	7.5	<10	73.5	ND
	03/02/05	<10	7.3	<10	71.7	ND
	04/13/05	<10	5.8	<10	59.2	ND
	05/16/05	<10	<10	<10	73.6	ND

Table D-2. (continued).

Well	Date Collected (mo/day/yr)	cis-DCE (µg/L)	PCE (µg/L)	trans-DCE (µg/L)	TCE (µg/L)	VC (µg/L)
	06/15/05	<10	<10	<10	116.7	ND
	07/20/05	<10	9.9	<10	133.2	ND
	08/17/05	<10	14.4	<10	143.4	ND
	09/13/05	<10	5.5	<10	194.9	ND
	09/13/05	<10	4.9	<10	197.2	ND

ND = nondetect  
 DCE = dichloroethene  
 PCE = tetrachloroethene  
 TAN = Test Area North  
 TCE = trichloroethene  
 VC = vinyl chloride

Table D-3. Radiological data for Wells TAN-29 and TAN-41.

Well	Date (mo/day/yr)	Sr-90		Minimum Detectable Activity	Gross Alpha		Gross Beta	
		(pCi/L)	+/-		(pCi/L)	+/-	(pCi/L)	+/-
TAN-29	08/16/05	8.45	0.482	0.756	-5.12	10.24	255	176
TAN-41	09/13/05	0.478	0.144	0.504				
TAN-41	09/13/05	0.455	0.156	0.590				